

FINAL
ENVIRONMENTAL ASSESSMENT
ADDRESSING THE REPAIR OF RUNWAY 05/23 AT
FAIRCHILD AIR FORCE BASE, WASHINGTON



NOVEMBER 2009

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14. ABSTRACT

The Proposed Action consists of two distinct actions: the first action includes repairing Runway 05/23 and replacing airfield lighting systems; and the second action includes the temporary relocation of aircraft, personnel, and equipment during Runway 05/23 closure. Under the Proposed Action, Fairchild AFB proposes to repair Runway 05/23 (Runway 05-the western end, and Runway 23-the eastern end) so that it is in compliance with Unified Facilities Criteria (UFC) 3-260-01 Airfield Planning and Design Criteria and UFC 3-260-02, Pavement Design for Airfields. Fairchild AFB's runway conditions have declined markedly in recent years. Most of the airfield pavements are in adequate condition; however, portions of the runway are declining to "critical" levels. Portions of existing airfield pavements are cracking, spalling, and scaling due to age and portions of the airfield pavement joint seals are damaged. Corner breaks and linear cracks are beginning to appear at the main departure end of Runway 23. Throughout the length of the runway, nearly every slab on the keel section has one or more patches, with nearly all of the patches on the transverse and centerline joints. In addition some pavements contain alkali-silica distress reaction (ASR) caused by the type of aggregate used during initial construction in 1956. ASR causes the formation of a gel around bad aggregate that leads to pavement cracking from the inside-out. The airfield pavements at Fairchild AFB have reached the end of their useful life and must be replaced in order to avoid having operations cause foreign object damage to aircraft. As part of the Proposed Action, Fairchild AFB also would replace airfield lighting systems so that they are in compliance with UFC 3-535-01, Visual Air Navigation Facilities. The airfield lighting systems include approach lights, threshold lights, runway lights, distance remaining markers, taxiway lights strobe lights, a precision approach path indicator system, a supporting main computer system, and cabling. The airfield lighting systems have been rated as "degraded" and the runway edge lights are incorrectly located and not in compliance with Air Force Instructions. During the construction and demolition phases of the Proposed Action, Runway 05/23 would be closed to aircraft activity, with the exception of helicopters, which would continue to utilize portions of the airfield areas during implementation of the Proposed Action. During closure of Runway 05/23, some aircraft support equipment, and mission-support personnel at Fairchild AFB would be temporarily relocated to either Grant County International Airport (IAP) or Spokane IAP. This EA evaluates the potential environmental consequences of the Proposed Action and alternatives including the No Action Alternative, on the following nine general impact topics: air quality, geological

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Finding of No Significant Impact (FONSI)

Final Environmental Assessment (EA) Addressing the Repair of Runway 05/23 at Fairchild Air Force Base, Washington

Introduction

Federal actions that potentially involve significant impacts to the environment must be reviewed in accordance with the National Environmental Policy Act (NEPA) and all other applicable laws. The U.S. Air Force (USAF) has completed an Environmental Assessment (EA) to address the potential environmental consequences associated with the repair of Runway 05/23 (Runway 05-the western end, and Runway 23-the eastern end) and replacement of airfield lighting systems at Fairchild Air Force Base (AFB) and the temporary relocation of aircraft, personnel, and equipment during the temporary closure of Runway 05/23. This Finding of No Significant Impact (FONSI) incorporates the EA by reference.

Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to repair Runway 05/23 to meet the requirements for medium-strength runway pavements and comply with applicable USAF design criteria for airfields. This would allow for an adequately sized runway that meets the dimensions and weight-bearing capacity requirements for KC-135 aircraft. In addition, the purpose of the Proposed Action includes the replacement of airfield lighting systems to meet Air Force Instruction (AFI) and Unified Facilities Criteria (UFC) requirements.

The Proposed Action is needed to bring Runway 05/23 into compliance with UFC 3-260-01, Airfield Planning and Design Criteria and UFC 3-260-02, Pavement Design for Airfields. In addition, the Proposed Action is needed to bring airfield lighting systems into compliance with UFC 3-535-01, Visual Air Navigation Facilities. Currently, some of the airfield pavements are in adequate condition; however, portions of the runway are declining to "critical" levels. As noted in the May 2007 *Airfield Pavement Condition Survey*, the 47-year-old Portland Cement Concrete (PCC) pavement has reached the end of its useful life and must be replaced in order to avoid having operations on the runway cause foreign object damage (FOD) to aircraft. This report also indicated that portions of existing airfield pavements are cracking, spalling, and scaling due to age and portions of the airfield pavement joint seals are damaged.

Description of the Proposed Action

The Proposed Action consists of two distinct actions: the first action would include repairing Runway 05/23 and replacing airfield lighting systems; and the second action would include the temporary relocation of aircraft, personnel, and equipment to two other airfields during the temporary closure of Runway 05/23.

Repairing Runway 05/23 and Replacing Airfield Lighting Systems. Under the Proposed Action, Fairchild AFB proposes to repair Runway 05/23 and Replace Airfield Lighting Systems. The Proposed Action would consist of the following construction and demolition (C&D) activities:

- Existing runway PCC and Hot Mix Asphalt (HMA) pavements, overruns, and portions of the attached taxiways would be demolished.
- The overall width of Runway 05/23 would be reduced from 300 feet to 150 feet of full-strength concrete pavement with 25-foot-wide HMA shoulders. The finished overruns would be 150 feet wide without paved shoulders.
- Runway traverse slopes would be established at a maximum of 1.50 percent-grade in order to maximize drainage and reduce length of reconstruction on the ladder taxiways.
- The entire length of six storm water pipes servicing the runway area, extending from the existing drainage structure at the upstream end of each pipe to the existing drainage structure at the downstream end of each pipe, would be replaced.
- Existing airfield lighting equipment associated with the runway would be removed and replaced with new airfield lighting systems. The new airfield lighting systems would include high-intensity approach light systems, high-intensity runway edge lights, threshold lights for both ends of the runway, runway distance markers, runway centerline lights, touchdown zone lights at both ends of the runway, taxiway clearance bars at each intersecting taxiway, precision approach path indicator at both ends of the runway, Runway 23 master sequence cabinet/controls for strobe light system, duct bank systems (including one conduit per series circuit, additional communications, and spare duct bank runway crossings), counterpoise lighting protection system photometric tests for all airfield lighting, taxiway edge lights at reconstructed taxiway fillets, and modification and replacement of computer-controlled systems. The new airfield lighting systems would use newer technology and meet the requirements of UFC 3-535-01.
- The western side of Building 2014 (airfield lighting vault) would be expanded southwest, approximately 20 feet. Expansion of Building 2014 would also include significantly modifying or replacing the layout of the vault and existing equipment to accommodate the new airfield lighting systems. Building 2014 currently uses a 565-kilowatt diesel stand-by generator. A new generator might be required to accommodate the proposed additional airfield lighting loads.
- New airfield signage associated with all runway and taxiway intersections would be installed.
- New ductbanks, handholes, and manholes for maintenance access would be installed.
- Building 1101 would be demolished.

Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure. During closure of Runway 05/23, some of the aircraft, aircraft support equipment, and mission-support personnel at Fairchild AFB would be temporarily relocated to Grant County International Airport (IAP) and Spokane IAP. Fairchild AFB would temporarily relocate aircraft, equipment, and personnel to Grant County IAP and Spokane IAP during the period of 31 January 2010 to 31 December 2010. Grant County IAP would become the main operating base for the 92d ARW aircraft and crews during Runway 05/23 closure. No construction or ground disturbing activities would occur because of the temporary relocation. Relocated aircraft, personnel, and equipment would utilize existing facilities and ramp space at Grant County IAP and Spokane IAP. Corrosion control and other maintenance activities would be conducted at Grant County IAP and Spokane IAP as needed.

Description of the No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23 or replace associated airfield lighting systems. Airfield runway and shoulder pavements would continue to degrade and would remain noncompliant with UFC 3-260-01 and UFC 3-260-02. Airfield pavements considered to be in "critical"

condition would not be replaced. The USAF would continue to repair cracks and deteriorating areas by patching. However, Runway 05/23 would eventually reach the end of its useful life, which would hinder essential Fairchild AFB mission activities and increase foreign object and debris hazards to aircraft. In addition, airfield lighting systems would continue to degrade and would remain noncompliant with UFC 3-535-01.

Summary of Anticipated Environmental Impacts

The Proposed Action and No Action Alternative have been reviewed in accordance with NEPA as implemented by the regulations of the Council on Environmental Quality (CEQ) and 32 Code of Federal Regulations (CFR) 989 (*Environmental Impact Analysis Process [EIAP]*). The public and regulatory agency scoping process focused the analyses on the following environmental resources: air quality, geological resources, water resources, biological resources, cultural resources, transportation, safety, utilities and infrastructure, and hazardous materials and wastes. Details of the environmental consequences can be found in the Environmental Assessment (EA), which is hereby incorporated by reference.

Cumulative Impacts. An analysis of the Proposed Action, in conjunction with other present and proposed activities, concluded that no significant cumulative environmental impacts would occur.

Public Review

Based on the description of the Proposed Action as set forth in the EA, all activities were found to comply with the criteria or standards of environmental quality and coordinated with the appropriate Federal, state, and local agencies. The draft of this EA and FONSI were made available to the public for a 30-day review period and no public comments were received. Agencies were coordinated with throughout the EA process and their comments were incorporated into the analysis of potential environmental impacts performed as part of this EA.

Finding of No Significant Impact

Based on the information and analysis presented in the EA conducted in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality Regulations, implementing regulations set forth in 32 CFR 989 (*EIAP*), as amended, and review of the agency comments submitted during the 30-day public comment period, I conclude that implementation of the Proposed Action would not result in significant impacts to the quality of the human or natural environment. For these reasons, a FONSI is approved and preparation of an Environmental Impact Statement is not warranted. This decision has been made after taking into account all submitted information, and considering a full range of practical alternatives that would meet project requirements and are within the legal authority of the USAF.



RONALD R. DANIELS, Executive Secretary
ESOH Council

3 Nov 2009

Date

Attachment: *Final Environmental Assessment Addressing the Repair of Runway 05/23 at Fairchild Air Force Base, Washington*

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ABBREVIATIONS AND ACRONYMS

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter	CRS	Cultural Resources Survey
ACHP	Advisory Council on Historic Preservation	CWA	Clean Water Act
ACM	asbestos-containing material	CY	cubic yards
AEM	Area Equivalent Method	dBA	A-weighted decibels
AETC	Air Education and Training Command	DESC	Defense Energy Support Center
AFB	Air Force Base	DOD	Department of Defense
AFI	Air Force Instruction	DWCF	Defense Working Capital Fund
AFPMB	Armed Forces Pest Management Board	e ² M	engineering-environmental Management, Inc.
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health	EA	Environmental Assessment
AFPD	Air Force Policy Directive	EAID	Equipment Authorization Inventory Data
AGL	above ground level	EIAP	Environmental Impact Analysis Process
ALSF-1	Approach Lighting System with Sequence Flashing Lights	EIS	Environmental Impact Statement
AMC	Air Mobility Command	EO	Executive Order
AOC	Areas of Concern	ERP	Environmental Restoration Program
AQCR	Air Quality Control Region	ESA	Endangered Species Act
AR	air refueling	EWNII	Eastern Washington-Northern Idaho Interstate
ARW	Air Refueling Wing	FAA	Federal Aviation Administration
ASR	alkali-silica distress reaction	FOD	foreign object damage
AST	aboveground storage tank	FONSI	Finding of No Significant Impact
BASH	Bird/Wildlife Aircraft Strike Hazard	FPPA	Farmland Protection Policy Act
BMP	best management practice	FY	fiscal year
C&D	construction and demolition	GHG	greenhouse gas
CAA	Clean Air Act	GMA	Growth Management Act
CAIS	Chemical Agent Identification Sets	HAP	Hazardous Air Pollutant
CCR	Constant Current Regulators	HMA	hot mix asphalt
CEQ	Council on Environmental Quality	HQ	headquarters
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	I	Interstate Highway
CFR	Code of Federal Regulations	IAP	International Airport
CO	carbon monoxide	ICRMP	Integrated Cultural Resources Management Plan
CO ₂	carbon dioxide	IERA	U.S. Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis

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IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
JP-4	Jet Propellant-4
JP-8	Jet Propellant-8
kV	Kilovolts
kW	Kilowatts
LBP	lead-based paint
mg/m ³	milligrams per cubic meter
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFA	No Further Action
NFRAP	No Further Remedial Action Planned
NHPA	National Historic Preservation Act
NO _x	nitrogen oxides
NO ₂	nitrogen dioxide
NOA	Notice of Availability
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O ₃	Ozone
OSHA	Occupational Safety and Health Administration
OWS	oil/water separators
PAH	polycyclic aromatic hydrocarbons
PAPI	precision approach path indicator
Pb	Lead
PCC	Portland Cement Concrete
pCi/L	picoCuries per liter
percent g	percent of the force of gravity
PM ₁₀	particulate matter less than 10 microns in diameter

PM _{2.5}	particulate matter less than 2.5 microns in diameter
POL	petroleum, oil, and lubricants
ppm	parts per million
PSD	Prevention of Significant Deterioration
RA-O	Remedial Action-Operation
RCRA	Resource Conservation and Recovery Act of 1976
RCW	Revised Code of Washington
ROI	region of influence
SAP	satellite accumulation point
SEL	Sound Exposure Level
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SQER	small quantity emission rate
SRCAA	Spokane Regional Clean Air Agency
SWPPP	Storm Water Pollution Prevention Plan
TCE	Trichloroethylene
TIM	Technical Information Memorandum
tpy	tons per year
U.S.C.	United States Code
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
UXO	Unexploded ordnance
VOC	volatile organic compound
WAC	Washington Administrative Code
WANG	Washington Air National Guard
WDE	Washington State Department of Ecology

COVER SHEET

FINAL ENVIRONMENTAL ASSESSMENT

ADDRESSING THE REPAIR OF RUNWAY 05/23 AT FAIRCHILD AIR FORCE BASE, WASHINGTON

Responsible Agencies: U.S. Air Force (USAF), 92nd Air Refueling Wing, Fairchild Air Force Base (AFB), and Air Mobility Command.

Affected Location: Fairchild AFB, Washington.

Report Designation: Final Environmental Assessment (EA).

Abstract: The Proposed Action consists of two distinct actions: the first action includes repairing Runway 05/23 and replacing airfield lighting systems; and the second action includes the temporary relocation of aircraft, personnel, and equipment during Runway 05/23 closure. Under the Proposed Action, Fairchild AFB proposes to repair Runway 05/23 (Runway 05-the western end, and Runway 23-the eastern end) so that it is in compliance with Unified Facilities Criteria (UFC) 3-260-01, *Airfield Planning and Design Criteria* and UFC 3-260-02, *Pavement Design for Airfields*. Fairchild AFB's runway conditions have declined markedly in recent years. Most of the airfield pavements are in adequate condition; however, portions of the runway are declining to "critical" levels. Portions of existing airfield pavements are cracking, spalling, and scaling due to age and portions of the airfield pavement joint seals are damaged. Corner breaks and linear cracks are beginning to appear at the main departure end of Runway 23. Throughout the length of the runway, nearly every slab on the keel section has one or more patches, with nearly all of the patches on the transverse and centerline joints. In addition, some pavements contain alkali-silica distress reaction (ASR) caused by the type of aggregate used during initial construction in 1956. ASR causes the formation of a gel around bad aggregate that leads to pavement cracking from the inside-out. The airfield pavements at Fairchild AFB have reached the end of their useful life and must be replaced in order to avoid having operations cause foreign object damage to aircraft.

As part of the Proposed Action, Fairchild AFB also would replace airfield lighting systems so that they are in compliance with UFC 3-535-01, *Visual Air Navigation Facilities*. The airfield lighting systems include approach lights, threshold lights, runway lights, distance remaining markers, taxiway lights, strobe lights, a precision approach path indicator system, a supporting main computer system, and cabling. The airfield lighting systems have been rated as "degraded" and the runway edge lights are incorrectly located and not in compliance with Air Force Instructions.

During the construction and demolition phases of the Proposed Action, Runway 05/23 would be closed to aircraft activity, with the exception of helicopters, which would continue to utilize portions of the airfield areas during implementation of the Proposed Action. During closure of Runway 05/23, some aircraft, aircraft support equipment, and mission-support personnel at Fairchild AFB would be temporarily relocated to either Grant County International Airport (IAP) or Spokane IAP.

This EA evaluates the potential environmental consequences of the Proposed Action and alternatives, including the No Action Alternative, on the following nine general impact topics: air quality, geological resources, water resources, biological resources, cultural resources, transportation, safety, utilities and infrastructure, and hazardous materials and wastes.

Inquiries regarding this document should be sent to the 92nd Air Refueling Wing, Public Affairs Office, Fairchild AFB, Washington, 99011.

FINAL

**ENVIRONMENTAL ASSESSMENT
ADDRESSING THE REPAIR OF RUNWAY 05/23 AT
FAIRCHILD AIR FORCE BASE, WASHINGTON**

**92nd Air Refueling Wing
Public Affairs Office
Fairchild Air Force Base, Washington 99011-9688
(509) 247-5706**

NOVEMBER 2009

**FINAL
ENVIRONMENTAL ASSESSMENT ADDRESSING THE REPAIR OF RUNWAY 05/23 AT
FAIRCHILD AIR FORCE BASE, WASHINGTON**

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1. Purpose of and Need for the Proposed Action

This Environmental Assessment (EA) addresses Fairchild Air Force Base's (AFB) proposal to repair Runway 05/23 (Runway 05-the western end, and Runway 23-the eastern end); replace airfield lighting systems; and temporarily relocate aircraft, personnel, and equipment during Runway 05/23 closure. This section presents the purpose of and need for the Proposed Action, the location and mission of Fairchild AFB, a summary of key environmental compliance requirements, and an introduction to the organization of this EA.

1.1 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to repair Runway 05/23 to meet the requirements for medium-strength runway pavements and comply with applicable U.S. Air Force (USAF) design criteria for airfields. This would allow for an adequately sized runway that meets the dimensions and weight-bearing capacity requirements for KC-135 aircraft. In addition, the purpose of the Proposed Action is to replace airfield lighting systems to meet Air Force Instruction (AFI) and Unified Facilities Criteria (UFC) requirements.

The Proposed Action is needed to bring Runway 05/23 in compliance with UFC 3-260-01, *Airfield Planning and Design Criteria* and UFC 3-260-02, *Pavement Design for Airfields*. Fairchild AFB's runway condition has declined markedly in recent years. According to two recent Pavement Condition Index surveys on the Portland Cement Concrete (PCC) slabs, the surface conditions of airfield pavement ranges from "adequate" to "critical." Most of the airfield pavements are in adequate condition; however, portions of the runway are declining to "critical" levels (FAFB 2008a). As noted in the May 2007 *Airfield Pavement Condition Survey* (FAFB 2008a), the 47-year-old PCC pavement has reached the end of its useful life and must be replaced in order to avoid having operations on the runway cause foreign object damage (FOD) to aircraft. This report also indicated that portions of existing airfield pavements are cracking, spalling, and scaling due to age and portions of the airfield pavement joint seals are damaged. Corner breaks and linear cracks are beginning to appear at the main departure end of Runway 23. Throughout the length of the runway, nearly every slab on the keel section has one or more patches, with nearly all of the patches located on the transverse and centerline joints. In addition, some pavements contain alkali-silica distress reaction (ASR) caused by the type of aggregate used during initial construction in 1956. ASR causes the formation of a gel around bad aggregate that leads to pavement cracking from the inside-out.

In addition, the Proposed Action is needed to bring airfield lighting systems into compliance with UFC 3-535-01, *Visual Air Navigation Facilities*. The airfield lighting systems include approach lights, threshold lights, runway lights, distance remaining markers, taxiway lights, strobe lights, precision approach path indicator (PAPI) system, a main supporting computer system, and cabling. Within the past 13 years, many of the airfield electrical systems (e.g., PAPI, airfield lighting vault, distance markers, and signage) have been replaced or upgraded, including the electrical service that extends from the airfield lighting vault, under the ramp, and out to the airfield. However, the runway edge lights are incorrectly located and are not in compliance with AFIs. Some lighting structures are nonfrangible airfield obstructions. Some of the taxiway lights are not flush with the pavement surface, and snow removal operations frequently damage the lights. In May 2007, the Infrastructure Assessment Team from Air Mobility Command (AMC) rated airfield lighting systems as "degraded." The runway edge lighting and threshold lights are not in compliance with UFC 3-535-02 for a 200-foot-wide runway. Taxiway edge lighting is incorrectly located, approach lights are blocked by fencing, and the 1,000-foot light bar needs the correct number of fixtures (FAFB 2009d).

1.2 Fairchild AFB Mission and Proposed Action Locations

Fairchild AFB is home to the 92nd Air Refueling Wing (ARW) and is under the command and control of AMC. Fairchild AFB's rich history and important mission make it one of the nation's preeminent military installations, as is proudly affirmed in its mission statement: *“Support America's War Fighters with Global Reach Airpower and Agile Combat Support”* and to *“Perform air refueling, airlift, and aeromedical evacuation missions supporting US and coalition conventional operations and USSTRATCOM strategic deterrence missions.”* The 92nd ARW, in association with the 141st ARW of the Washington Air National Guard (WANG) and 509th Weapons Squadron, operate 35 KC-135 aircraft and 56 aircrews to support worldwide military missions refueling fighter, bomber, reconnaissance, and airlift aircraft, as well as providing rapid and reliable passenger and cargo airlift. In addition to the 92nd ARW, Fairchild AFB is home to more than 15 tenant units including the Air Education and Training Command (AETC) Survival School and the Joint Personnel Recovery Agency. The 242nd and 256th Combat Communications Squadrons of the WANG are scheduled to move into facilities on Fairchild AFB in Fiscal Year (FY) 2010. The 92nd ARW also provides administrative, medical, and logistical support for additional tenant agencies and the Fairchild AFB community.

Fairchild AFB is a 5,823-acre military installation in Spokane County, Washington. It is approximately 12 miles west of the City of Spokane, in the east-central portion of Washington State (see **Figure 1-1**). The Fairchild AFB airfield includes ten taxiways; four parking aprons; one alert area; and one northeast-southwest directional runway (Runway 05/23). Runway 05/23 is approximately 13,900 feet in length from threshold to threshold, with 1,000-foot paved overrun on each end of the runway. The width of the runway pavement is 200 feet throughout its length. The concrete ends are 300 feet wide for the first 1,300 linear feet and 1,000 linear feet from Runway 05 and Runway 23, respectively. The interior portion narrows to the 75-foot concrete keel width. This keel is bordered on each side by hot mix asphalt (HMA) pavements that are 62.5 feet wide, to comprise a 200-foot-wide marked runway pavement. There are 25-foot-wide shoulders with an additional 25 feet of abandoned pavement on each side of the runway (FAFB 2009b). **Figure 1-2** shows an aerial view of Fairchild AFB and proposed project areas.

Spokane International Airport (IAP) is a commercial airport 5 miles west of downtown Spokane, Washington (see **Figure 1-1**). Spokane IAP is the primary airport for Spokane, Eastern Washington, Coeur d'Alene, and Northern Idaho and is the second largest airport in the State of Washington.

Grant County IAP is a public airport 5 miles northwest of downtown Moses Lake, Washington (see **Figure 1-1**). Grant County IAP is one of the largest airports in the United States and an alternate landing site for the National Aeronautics and Space Administration space shuttle. Grant County IAP was formerly Larson AFB, which closed due to Department of Defense (DOD) budget reductions in 1966.

1.3 Summary of Key Environmental Compliance Requirements

1.3.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] Section 4321-4347) is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decisionmakers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis.

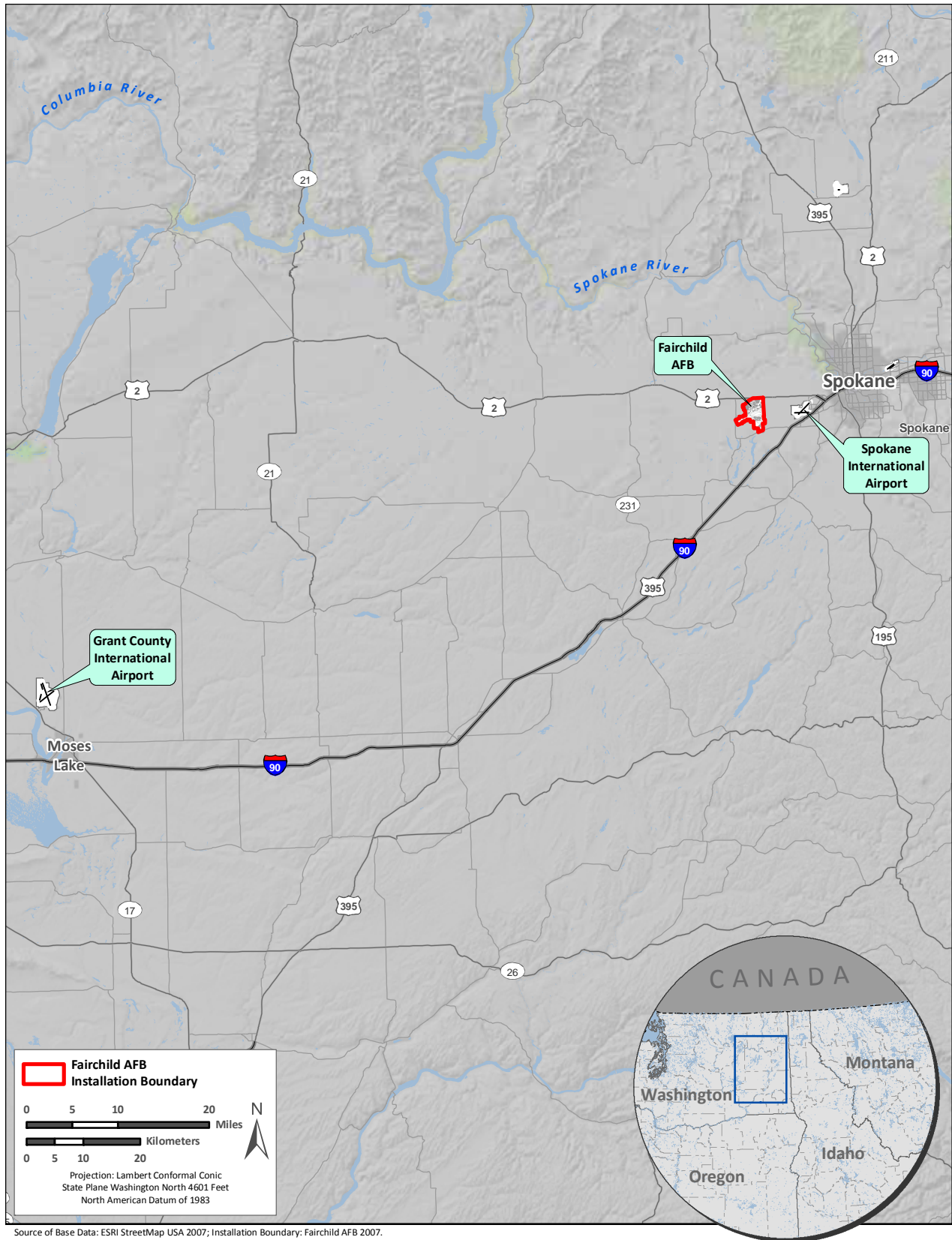


Figure 1-1. Fairchild AFB and Surrounding Areas



Figure 1-2. Fairchild AFB and Proposed Project Areas

This approach also requires Federal agencies to use an interdisciplinary and systematic approach in their decisionmaking process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action.

The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR), Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ regulations specify that an EA be prepared to briefly provide evidence and analysis for determining whether to prepare a Finding of No Significant Impact (FONSI) or whether the preparation of an Environmental Impact Statement (EIS) is necessary. The EA can aid in an agency's compliance with NEPA when an EIS is unnecessary and facilitate preparation of an EIS when one is required.

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is the *Environmental Impact Analysis Process* (EIAP), 32 CFR Part 989, as amended.

1.3.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decisionmaking process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of key environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated “with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively.”

1.3.2.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

This EA will examine potential impacts of the Proposed Action and alternatives on nine resource areas when analyzing the repair of Runway 05/23 and replacing airfield lighting systems. These include air quality, geological resources, water resources, biological resources, cultural resources, transportation, safety, utilities and infrastructure, and hazardous materials and wastes. These resources could potentially be affected by the Proposed Action and include applicable elements of the human environment that are prompted for review by Executive Order (EO), regulation, or policy. Some environmental resources and conditions that are often analyzed in an EA have been omitted from this analysis. The following details the basis for such exclusions:

- **Land Use.** All activities associated with the Proposed Action would be consistent with present and foreseeable land use patterns at Fairchild AFB. Implementation of the Proposed Action would not significantly alter the existing land use at Fairchild AFB. Accordingly, the USAF has omitted detailed examination of land use.
- **Noise.** Implementation of the Proposed Action does not involve permanent alterations to aircraft inventories, operations, or missions. No new permanent ground-based heavy equipment operations are included in the Proposed Action. No activity included in the Proposed Action would result in a situation where residences would be impacted by an increase in present ambient noise levels. Furthermore, noise produced by construction and demolition (C&D) activities associated with the Proposed Action would not significantly affect sensitive receptors. Accordingly, USAF has omitted detailed examination of noise.

- **Socioeconomics.** The Proposed Action does not involve any activities that would directly affect off-installation activities, or directly or indirectly contribute to changes in socioeconomic resources. There would be no change in the number of personnel assigned to Fairchild AFB and no changes in area population or associated changes in demand for housing and services. Accordingly, USAF has omitted detailed examination of socioeconomics in this EA.
- **Environmental Justice.** The Proposed Action does not involve any activities that would contribute to changes in low-income or minority populations because all work would be performed within the installation boundary. Accordingly, USAF has omitted detailed examination of environmental justice.

1.3.2.2 Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure

This EA will examine potential impacts of the Proposed Action and alternatives on three resource areas when analyzing the temporary relocation of aircraft, personnel, and equipment during Runway 05/23 closure. These include noise, air quality, and hazardous materials and wastes. These resources could potentially be affected by the Proposed Action and include applicable elements of the human environment that are prompted for review by EO, regulation, or policy. Some environmental resources and conditions that are often analyzed in an EA have been omitted from this analysis. The following details the basis for such exclusions:

- **Land Use.** All activities associated with the Proposed Action would be consistent with present and foreseeable land use patterns at Grant County IAP and Spokane IAP. Implementation of the Proposed Action would not significantly alter the existing land use at Grant County IAP and Spokane IAP. Accordingly, the USAF has omitted detailed examination of land use.
- **Socioeconomics.** The Proposed Action does not involve any activities that would directly affect Grant County IAP, Spokane IAP or surrounding communities, or directly or indirectly contribute to changes in socioeconomic resources at these locations. Personnel relocated to Grant County IAP and would be there only on a temporary basis. Personnel temporarily relocated to Spokane IAP would still be living and operating at their original locations since it is only 4 miles from Fairchild AFB. There would be no permanent change in the number of personnel assigned to Grant County IAP or Spokane IAP and no permanent changes in area population or associated changes in demand for housing and services at these locations. Accordingly, USAF has omitted detailed examination of socioeconomics in this EA.
- **Environmental Justice.** The Proposed Action does not involve any activities that would contribute to changes in low-income or minority populations because all work would be performed within the installation boundary. Accordingly, USAF has omitted detailed examination of environmental justice.
- **Geological Resources, Water Resources, Biological Resources, Cultural Resources, Transportation, Safety, and Utilities and Infrastructure.** The Proposed Action does not involve construction or any other groundbreaking activities at Grant County IAP or Spokane IAP. Therefore, there would be no impact to these resources areas. Accordingly, USAF has omitted detailed examination of these resources areas.

In accordance with EO 11990, *Protection of Wetlands*, and AFI 32-7064, *Integrated Natural Resources Management*, the USAF maintains a no net loss policy regarding all wetlands and must demonstrate that there are no practicable alternatives to construction within wetlands. Although wetlands occur on Fairchild AFB, no wetland areas would be directly or indirectly impacted by the Proposed Action.

Appendix A contains examples of relevant laws, regulations, and other requirements that are often considered as part of the analysis. Where useful to better understanding, key provisions of the statutes and EOs described in **Appendix A** will be discussed in more detail in the text of this EA.

1.3.3 Interagency and Intergovernmental Coordination for Environmental Planning and Public Involvement

NEPA requirements help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process. The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. AFI 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning* (IICEP), requires the USAF to implement the IICEP process, which is used for the purpose of agency coordination and implements scoping requirements.

Through the IICEP process, Fairchild AFB notified relevant Federal, state, and local agencies of the Proposed Action and alternatives and provided them sufficient time to make known their environmental concerns specific to the action. The IICEP process also provided Fairchild AFB the opportunity to cooperate with and consider state and local views in implementing the Federal proposal. All IICEP material related to this EA is included in **Appendix B**. Two agency comments were received on the Draft EA and FONSI during the review period. All agencies contacted during the IICEP process, comments received, and responses to comments received are listed in **Appendix B**.

A Notice of Availability (NOA) was published in the *Spokane Spokesman Review* and *Moses Lake Columbia Basin Herald* and made available to the public for a 30-day review period. The NOA was issued to solicit comments on the Proposed Action and involve the local community in the decisionmaking process. No public comments on the Draft EA and FONSI were received during this review period. Agency comments on the Draft EA were considered prior to a decision being made as to whether or not to sign a FONSI. **Appendix B** includes a copy of the NOAs as they appeared in the *Spokane Spokesman Review* and *Moses Lake Columbia Basin Herald*.

1.4 Organization of this Document

This EA is organized into six sections, plus three appendices. **Section 1** of the EA provides the purpose of and need for the Proposed Action. **Section 2** contains a description of the Proposed Action, the No Action Alternative, and alternatives considered but eliminated from detailed analysis. **Section 3** contains a general description of the environmental resources and baseline conditions that could potentially be affected by the Proposed Action and the No Action Alternative; and an analysis of the potential environmental consequences of implementing the Proposed Action and the No Action Alternative. **Section 4** contains an analysis of the potential cumulative effects at Fairchild AFB, Spokane IAP, and Grant County IAP. **Section 5** contains a list of references used during the preparation of this EA. **Section 6** contains a list of the preparers of the document. **Appendix A** contains applicable laws, regulations, policies, and planning criteria potentially relevant to NEPA analysis. **Appendix B** includes all IICEP materials. **Appendix C** contains the air quality conformity analysis. **Appendix D** contains calculations to support the noise evaluation.

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2. Description of Proposed Action and Alternatives

This section describes the Proposed Action, the No Action Alternative, and alternatives considered but eliminated from detailed analysis. As discussed in **Section 1.3.1**, the NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action, as defined in **Section 1.1**. In addition, CEQ regulations also specify the inclusion of a No Action Alternative against which potential impacts can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail in accordance with CEQ regulations. Implementation of the Proposed Action, as described in **Section 2.1**, is Fairchild AFB's Preferred Alternative.

2.1 Proposed Action

The Proposed Action consists of two distinct actions: the first action would include repairing Runway 05/23 and replacing airfield lighting systems; and the second action would include the temporary relocation of aircraft, personnel, and equipment during Runway 05/23 closure.

2.1.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

The Proposed Action would consist of the following C&D activities (FAFB 2009b):

- Existing runway PCC and HMA pavements, overruns, and portions of the attached taxiways would be demolished.
- The overall width of Runway 05/23 would be reduced from 300 feet to 150 feet of full-strength concrete pavement with 25-foot-wide HMA shoulders. The finished overruns would be 150 feet wide without paved shoulders.
- Runway traverse slopes would be established at a maximum of 1.50 percent-grade in order to maximize drainage and reduce length of reconstruction on the ladder taxiways.
- The entire length of six storm water pipes, extending from the existing drainage structure at the upstream end of each pipe to the existing drainage structure at the downstream end of each pipe, would be replaced.
- Existing airfield lighting equipment associated with the runway would be removed and replaced with new airfield lighting systems. The new airfield lighting systems would include high-intensity approach light systems, high-intensity runway edge lights, threshold lights for both ends of the runway, runway distance markers, runway centerline lights, touchdown zone lights at both ends of the runway, taxiway clearance bars at each intersecting taxiway, PAPI at both ends of the runway, Runway 23 master sequence cabinet/controls for strobe light system, duct bank systems (including one conduit per series circuit, additional communications, and spare duct bank runway crossings), counterpoise lighting protection system photometric tests for all airfield lighting, taxiway edge lights at reconstructed taxiway fillets, and modification and replacement of computer-controlled systems. The new airfield lighting systems would use newer technology and meet the requirements of UFC 3-535-01.
- The western side of Building 2014 (airfield lighting vault) would be expanded southwest, approximately 20 feet. Expansion of Building 2014 would also include significantly modifying or replacing the layout of the vault and existing equipment to accommodate the new airfield lighting systems. Building 2014 currently uses a 565-kiloWatt (kW) diesel stand-by generator. A new generator might be required to accommodate the proposed additional airfield lighting loads.

- New airfield signage associated with all runway and taxiway intersections would be installed.
- New ductbanks, handholes, and manholes for maintenance access would be installed.
- Building 1101 would be demolished.

All repair and reconstruction activities would be in conformance with UFC 3-260-01, UFC 3-260-02, and UFC 535-01. The Proposed Action would start in either FY 2010 or FY 2011 and would take approximately 10 months to complete. Construction activities and materials would promote as many Leadership in Energy and Environmental Design points as possible to demonstrate good environmental stewardship.

Haul routes would begin along Highway 2 and vehicles would enter the proposed project site through the Commercial Gate Guard Check Point on Rambo Road. The haul route would then continue along the unpaved roadway adjacent to Rambo Road and on to Taxiway K. The staging area for construction equipment, soil, aggregate, concrete, and asphalt piles would be on the western half of Taxiway K.

It is assumed that a concrete and asphalt batch plant and two rock crushers would be required during demolition of the existing pavements and construction of the new pavements. It is assumed that all materials for the three new pavement layers (i.e., concrete pavement surface, HMA shoulder pavement surface, and drainage layer) would be imported from local off-site borrow pits. It is also assumed that virtually all materials for the creation of the soil cement base layer (i.e., all materials except for the actual PCC slabs) would be generated from on-site HMA millings and reclaimed crushed aggregate base materials excavated from within the existing runway corridor. At no time would the ASR-affected materials generated from the crushed concrete be allowed under the new concrete pavement structure.

A material balance calculation has been performed using the above assumptions. The goal would be to minimize excess concrete (hailed off-site or remaining on-site) and maximize the utilization of the HMA millings and reclaimed crushed aggregate base materials in order to minimize excess waste.

Estimated amounts of soil, aggregate, concrete, and asphalt materials that would be required for the Proposed Action are provided in **Table 2-1**. Demolition of existing concrete runway pavement would be expected to generate 83,100 cubic yards (CY) of material. Removal of HMA pavement would be expected to generate 40,000 CY of material. In addition, some of the viable existing pavement materials would be excavated to create a void for the new imported pavement materials. This optimization of the earthwork would result in the reuse of approximately 60,000 CY of crushed concrete pavement that would be placed beneath the new runway's paved shoulders, turf shoulders, and paved overruns. This represents approximately 63 percent of the nearly 83,100 CY of concrete that would be removed from the runway and taxiway reconstruction areas. In addition to this concrete reuse, more than 40 percent of the approximately 40,000 CY of milled asphalt and an additional 19,420 CY of on-site harvested aggregate materials would be blended with reclaimed existing aggregate base materials to be reused as fill beneath the new concrete runway pavements. It is anticipated that approximately 23,100 CY of existing runway concrete would be left over for use in the construction and maintenance of the contractor's haul roads. The remainder of the runway asphalt millings not reused in the runway corridor, along with the materials generated from demolition of portions of the existing taxiways, would be used in the reconstruction of the connector taxiway tie-ins (FAFB 2009b). Approximately 28,000 CY of soil, 105,000 CY of new concrete, 10,250 CY of new asphalt, and 32,000 CY of aggregate for the new drainage layer would be imported from off-site borrow pits and other sources. The Proposed Action is anticipated to disturb approximately 55 acres.

Table 2-1. Runway Construction Materials Associated with the Proposed Action

Type of Material	On-Site		Off-Site	
	Amount of Material Generated (CY)	Amount of Material Reused (CY)	Total Net Export from Site Required (CY)	Amount of Materials Imported (CY)
Aggregate ^a	19,420 ^b	19,420	--	--
Existing Concrete	83,100	60,000	23,100 ^c	--
Existing Asphalt	40,000	16,300	23,700 ^d	--
Soil	--	--	--	28,000
New Concrete	--	--	--	105,500
New Asphalt	--	--	--	10,250
New Drainage Layer	--	--	--	32,000

Source: FAFB 2009b

Notes:

- Values provided are estimates based on available 100 percent design information. Values are not intended for engineering or cost estimating purposes. Actual values would be impacted by the final design considerations, field conditions, and contractor execution.
- Aggregate material obtained within the footprint of the abandoned pavement.
- Does not include crushed concrete that might be used to improve haul routes that might remain on-site at the completion of the project.
- Does not include asphalt millings that might be used to improve haul routes and parking areas and that might remain on-site after the completion of the project.

Borrow and aggregate materials not provided from reusing existing materials would be obtained from USEPA-approved borrow pits. Borrow pits have not been specifically identified. However, it is assumed that the chosen contractor would use borrow pits within a 30-mile radius of the installation.

Power for the batch plants and rock crushers would require the installation of 1,550 linear feet of overhead electric lines along Thorpe Road and 3,100 linear feet of underground electric lines to Taxiway K.

2.1.2 Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure

During closure of Runway 05/23, some of the aircraft, aircraft support equipment, and mission-support personnel at Fairchild AFB would be temporarily relocated to Grant County IAP and Spokane IAP. Fairchild AFB would temporarily relocate aircraft, equipment, and personnel to Grant County IAP and Spokane IAP during FY 2010 or FY 2011 and would last for approximately 10 months. Grant County IAP would become the main operating base for the 92nd ARW aircraft and crews during Runway 05/23 closure. No construction or ground disturbing activities would occur because of the temporary relocation. Relocated aircraft, personnel, and equipment would utilize existing facilities and ramp space at Grant County IAP and Spokane IAP. Corrosion control and other maintenance activities would be conducted at Grant County IAP and Spokane IAP as needed.

Aircraft Operations. During the C&D phases of the Proposed Action, Runway 05/23 would be closed to aircraft activity, with the exception of helicopters, which would continue to utilize portions of the airfield areas during implementation of the Proposed Action. Fairchild AFB would relocate approximately

15 KC-135 aircraft to Grant County IAP and five KC-135 aircraft to Spokane IAP during the Runway 05/23 closure. **Table 2-2** describes the baseline conditions at Grant County IAP and Spokane IAP and the proposed number of flight operations to be flown at each location. An operation is defined as a single aircraft movement, such as an arrival or a departure. Proposed aircraft operations would include, but would not be limited to, engine run-up, takeoffs, landings, pattern work, and other training needs. For the USAF, daytime flying hours are from 0700 to 2200 (7:00 a.m. to 10:00 p.m.) and nighttime flying hours are from 2200 to 0700 (10:00 p.m. to 7:00 a.m.). Operational hours for aircraft operations under the Proposed Action would be between 0700 and 2359 (7:00 a.m. to 11:59 p.m.), Monday to Friday, and very rarely on the weekends. At Grant County IAP, the majority (96.4 percent) of the proposed aircraft operations would be conducted during the day and only 3.6 percent would be conducted at night (2200 to 2359). At Spokane IAP, the majority (87.5 percent) of the proposed aircraft operations would be conducted during the day and only 12.5 percent would be conducted at night (2200 to 2359) (O'Connell 2009). The flight paths and altitudes arriving to and departing from Grant County IAP and Spokane IAP would be in accordance with the published approaches and departures for these airports. Fairchild AFB refueling flight operations would use the same refueling tracks that are currently used.

Table 2-2. Baseline and Proposed Aircraft Operations during Runway 05/23 Closure

Grant County IAP			Spokane IAP		
Current		Proposed	Current		Proposed
Year	Aircraft Operations		Year	Aircraft Operations	
2006	79,001	56 per day (13,720 total for Proposed Action) ^{a, b}	2006	95,628	16 per day (3,920 total for Proposed Action) ^{a, c}
2007	71,199		2007	101,323	
2008	70,515		2008	94,694	

Sources: HQ AMC 2008, e²M 2009c, FAA 2008a, FAA 2008b

Notes:

- a. Aircraft operations were estimated using 245 flight days (10 months, Monday to Friday with occasional weekends).
- b. Flight operations at Grant County IAP were calculated based on 56 flight operations per day.
- c. Flight operations at Spokane IAP were calculated based on 16 flight operations per day.

Personnel. Approximately 200 military personnel would be temporarily relocated to Grant County IAP to support the 92nd ARW mission. Mission-support personnel would include aircrew, maintenance teams, Logistics Readiness Squadron support teams, security forces, fire fighting personnel, as well as personnel from other installation support agencies. Mission support personnel would be housed in the Big Bend Community College dormitories or in local hotels for the duration of the Proposed Action. Big Bend Community College is on the grounds of Grant County IAP. Aircraft support personnel would be bused from Fairchild AFB to Grant County IAP on a weekly basis and would be on rotation. Mission support personnel temporarily relocated to Spokane IAP would work at this airport instead of Fairchild AFB and would be housed in their original locations since Spokane IAP is only 4 miles from Fairchild AFB.

Equipment. Aircraft maintenance would be conducted in existing, available maintenance facilities at Grant County IAP and Spokane IAP. Aircraft would have no additional maintenance requirements beyond what is currently being conducted at Fairchild AFB. The number and type of aircraft support equipment would vary based on mission requirements. Typical aircraft support equipment that could be relocated would include powered and non-powered aerospace ground equipment, and fuel spill trailers. A

number of empty 6,000 gallon fuel trucks would be sent from Fairchild AFB to Grant County IAP to support the 92nd ARW mission. Fuel supplies and purchases would be handled through the Defense Energy Support Center at Grant County IAP and Spokane IAP.

2.2 No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23 or replace associated airfield lighting systems. Airfield runway and shoulder pavements would continue to degrade and would remain noncompliant with UFC 3-260-01 and UFC 3-260-02. Airfield pavements considered to be in “critical” condition would not be replaced. The USAF would continue to repair cracks and deteriorating areas by patching. However, Runway 05/23 would eventually reach the end of its useful life, which would hinder essential Fairchild AFB mission activities and increase FOD hazards to aircraft. In addition, airfield lighting systems would continue to degrade and would remain noncompliant with UFC 3-535-01.

2.3 Alternatives Considered But Eliminated From Detailed Analysis

2.3.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

Two other alternatives were considered during initial planning stages to address the need for the Proposed Action. The first alternative considered was to shorten the length and width of the existing runway. After 92nd ARW evaluation of this alternative, it was determined that shortening the length of the runway would not allow the 92nd ARW to carry out its alert mission requirements. Therefore, this alternative was eliminated from further detailed analysis in the EA.

The second alternative considered was to replace the runway using its current footprint. The current width of the airfield surfaces at Fairchild AFB are not in compliance with UFC 3-260-01 and UFC 3-260-02 requirements. There are no new missions in the foreseeable future that would require Fairchild AFB to have a runway as wide as the current runway. In addition, the cost of maintaining a wider runway would not make this alternative feasible. Therefore, this alternative was eliminated from further detailed analysis in the EA.

2.3.2 Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure

Four other locations were considered to address the temporary relocation of aircraft, aircraft support equipment, and mission-support personnel during Runway 05/23 closure. These were Grand Forks AFB, North Dakota; March Air Reserve Base, California; Travis AFB, California; and McChord AFB, Washington. The first three locations were ruled out for economic reasons and because the locations could not support 92nd ARW’s currently tasked missions. Travis AFB and McChord AFB were ruled out because they do not have sufficient infrastructure to support 92nd ARW’s mission requirements. Therefore, these locations were eliminated from further detailed analysis in the EA.

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3. Affected Environment and Environmental Consequences

All potentially relevant resource areas were initially considered for analysis in this EA. In compliance with NEPA, CEQ, and EIAP 32 CFR Part 989 guidelines, the following discussion of the affected environment and environmental consequences focuses only on those resource areas considered potentially subject to impacts and with potentially significant environmental issues. This section includes noise, air quality, geology and soils, water resources, biological resources, cultural resources, infrastructure, transportation, hazardous materials and wastes, and safety.

This section presents an analysis of the potential direct and indirect impacts that each alternative would have on the affected environment. Each alternative was evaluated for its potential to affect physical, biological, and socioeconomic resources in accordance with CEQ guidelines at 40 CFR 1508.8.

The following discussion elaborates on the nature of the characteristics that might relate to various impacts:

- **Short-term or long-term.** These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. In general, short-term impacts are those that would occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term impacts are those that are more likely to be persistent and chronic.
- **Direct or indirect.** A direct impact is caused by and occurs contemporaneously at or near the location of the action. An indirect impact is caused by a proposed action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action. For example, a direct impact of erosion on a stream might include sediment-laden waters in the vicinity of the action, whereas an indirect impact of the same erosion might lead to lack of spawning and result in lowered reproduction rates of indigenous fish downstream.
- **Negligible, minor, moderate, or major.** These relative terms are used to characterize the magnitude or intensity of an impact. Negligible impacts are generally those that might be perceptible but are at the lower level of detection. A minor effect is slight, but detectable. A moderate impact is readily apparent. A major impact is one that is severely adverse or exceptionally beneficial.
- **Adverse or beneficial.** An adverse impact is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment. A single act might result in adverse impacts on one environmental resource and beneficial impacts on another resource.
- **Context.** The context of an impact can be localized or more widespread (e.g., regional).
- **Intensity.** The intensity of an impact is determined through consideration of several factors, including whether an alternative might have an adverse impact on the unique characteristics of an area (e.g., historical resources, ecologically critical areas), public health or safety, or endangered or threatened species or designated critical habitat. Impacts are also considered in terms of their potential for violation of Federal, state, or local environmental laws; their controversial nature; the degree of uncertainty or unknown impacts, or unique or unknown risks; if there are precedent-setting impacts; and their cumulative effects (see **Section 4**).

The impact analyses consider all alternatives discussed in **Section 2** that have been identified as reasonable for meeting the purpose of and need for action. These alternatives include the following:

- The Proposed Action (described in **Section 2.1**)
- The No Action Alternative (described in **Section 2.2**).

Sections 3.1 through **3.10** discuss potential environmental and socioeconomic impacts on the affected environment.

3.1 Noise

3.1.1 Definition of the Resource

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on the roof. Sound is measured with instruments that record instantaneous sound levels in decibels. A-weighted decibels (dBA) are used to characterize sound levels that can be sensed by the human ear. “A-weighted” denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event. All sound levels discussed in this EA are A-weighted. Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one’s ears or as annoying noise. Affected receptors can be specific (i.e., schools, churches, or hospitals) or broad areas (e.g., nature preserves or designated districts) in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise represents the most identifiable concern associated with aircraft operations. Although communities and even isolated areas receive more consistent noise from other sources (e.g., cars, trains, construction equipment, stereos, wind), the noise generated by aircraft overflights often receives the greatest attention. General patterns concerning the perception and effect of aircraft noise have been identified, but attitudes of individual people toward noise are subjective and depend on their situation when exposed to noise. Therefore, annoyance is considered the primary consequence of aircraft noise. The subjective impression of noise and the disturbance of activities are believed to contribute significantly to the general annoyance response. A number of non-noise-related factors have been identified that might influence annoyance.

The Sound Exposure Level (SEL) is the most useful noise metric for characterizing the noise associated with individual events such as a single aircraft flyover. The SEL takes into account the most important characteristics of time varying noise events such as aircraft flyovers, the changing sound levels that occur during the event, and the duration of the noise event. The SEL is a measure of the total sound exposure of an event compressed into a 1-second time interval. Thus, it takes in the sound energy of the event and represents it as a steady noise level that lasts for 1 second. It is important to note that the SEL does not represent the level of sound heard at any specific instant; however, it provides a measure of the total sound energy of a single event and permits comparison of events that differ in both level and duration.

Noise events from longer but quieter sounds can often have SEL values higher than a short, loud sound. While cumulative noise metrics are better for showing the noise exposure from multiple events, SEL is more useful for showing the effects of a single event. Generally speaking, a single-event metric is more desirable to the public because it displays the greatest possible short-term impact of a noise source.

Table 3-1 presents maximum noise levels during single-noise events. Although the noise levels shown in **Table 3-1** are not SEL values, because they are maximum single-event levels, they are comparable.

Table 3-1. Noise Levels of Common Sounds

Sound Level (dBA)	Noise Source (at a given distance)
30	Soft whisper
60	Normal conversation (5 feet)
80	Garbage disposal (3 feet); Busy street corner
90	Motorcycle (25 feet)
100	Ambulance siren (100 feet)
110	Pile driver (50 feet)
120	Jackhammer (50 feet)

Source: USACHPPM undated

3.1.2 Description of the Affected Environment

The KC-135 is a short to medium range tanker aircraft, meeting the air-refueling needs of USAF bomber, fighter, cargo, and reconnaissance forces. It also supports U.S. Army, U.S. Navy, U.S. Marine Corps, and allied aircraft. The typical air-refueling mission would use air-refueling (AR) tracks already established in the *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008) with generic routing to and from the tracks. There would be no new ARs established under the Proposed Action.

3.1.2.1 Fairchild AFB

Fairchild AFB is about 15 miles west from the city of Spokane in eastern Washington. There are two relatively small incorporated areas near Fairchild AFB, which include Medical Lake and Airway Heights. Medical Lake, which is approximately 2.5 miles south of Fairchild AFB, has a population of 3,758. Airway Heights, which is approximately 1.5 miles east of the installation, has a population of 4,500. Most of the land surrounding Fairchild AFB is categorized as vacant or agricultural. Noise sensitive receptors in the vicinity of Fairchild AFB would include residential communities in and around Medical Lake and Airway Heights (FAFB 2007c).

With the exception of increased aircraft noise in some areas adjacent to Fairchild AFB and Spokane IAP, the ambient environment around Fairchild AFB is likely to be relatively low. The land use in the region indicates that noise levels would fall into the category of a small town or quiet suburban area of approximately 50 dBA (FAFB 2007c).

Currently KC-135 aircraft are flown at Fairchild AFB. During the C&D phases of the Proposed Action, Runway 05/23 would be closed to aircraft activity, with the exception of helicopters, which would continue to utilize portions of the airfield areas during implementation of the Proposed Action. Fairchild AFB would relocate some of its KC-135 aircraft to Spokane IAP during the Runway 05/23 closure.

3.1.2.2 Grant County IAP

Grant County IAP is approximately 5 miles north of the city of Moses Lake, which has a population of 18,800 (U.S. Census Bureau 2008). Grant County IAP is a public airport with a mix of civilian and military flight operations. The airfield consists of two primary runways, two shorter runways, and one runway for C-17 training. Aircraft flight tracks from Grant County IAP avoid noise sensitive areas as much as possible and scheduled missions are kept consistent with operational and training requirements to keep noise levels low, especially at night. Grant County IAP is in a relatively rural area and aviation-related activities dominate the acoustic noise environment in the area (HQ AMC 2008).

3.1.2.3 Spokane IAP

Spokane IAP is approximately 4 miles east of Fairchild AFB and 5 miles west of downtown Spokane. Both Fairchild AFB and Spokane IAP have similar flight tracks, which are oriented northeast and southwest. Spokane IAP is a public-use airport that serves mostly commercial flights; however, some military aircraft operations are also conducted. The city of Spokane had a population of 202,319 in 2008 (U.S. Census Bureau 2008). Single family homes are adjacent to Spokane IAP to the north, east, and south. Some areas to the west of the airport are vacant.

According to a 2009 runway study at Spokane IAP, the alignment of Fairchild AFB aircraft as a tenant at Spokane IAP is a long-term consideration to improve efficiency, safety, and capacity of flight operations. In addition, there is also a long-term consideration to add an additional runway because of increased demand at Spokane IAP (Mead & Hunt 2009).

3.1.3 Environmental Consequences

Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a proposed action. Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), negligible (i.e., if the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level). Projected noise effects were evaluated qualitatively for the alternatives considered.

Aircraft Operations. Federal Aviation Administration (FAA) Order 1050.1E, *Environmental Impacts: Policies and Procedures*, provides FAA policy and procedures to ensure agency compliance with the requirements set forth in the CEQ regulations for implementing the provisions of NEPA (40 CFR parts 1500-1508), Department of Transportation Order 5610.1C, *Procedures for Considering Environmental Impacts*, and other related statutes and directives (FAA 2006). Per FAA Order 1050.1E, Appendix A, the initial analysis for proposed actions involving a single airport that result in a general overall increase in daily aircraft operations should be performed using the FAA's Area Equivalent Method (AEM) computer model. The AEM model is a screening procedure used to simplify the assessment step in determining the need for a detailed noise analysis. It is a mathematical procedure that provides an estimated change in noise contour area for an airport given the types of aircraft involved and the number of operations for each aircraft. The noise contour area is a measure of the size of the landmass enclosed within a specified noise level as produced by a given set of aircraft operations (FAA 2008c). Per FAA Order 1050.1E, if the AEM calculations indicate that a proposed action would result in less than a 17 percent increase in the noise contour area, it "may be concluded that there would be no significant impact over noise sensitive areas and that no further noise analysis is required" (FAA 2006). If the model detects a 17 percent or greater increase in the noise contour area, the proposed action could result in a significant impact;

therefore, the comparison of baseline to alternative is beyond the scope of the AEM model and a more detailed analysis would be required.

Aircraft Overflights. Individuals are often interested in what they might personally experience from an aircraft overflight in their vicinity. If an aircraft passes directly overhead at low altitude, the SEL can exceed 100 dBA. Using the Flyover Noise Calculator developed by the USAF Research Laboratory at Wright-Patterson AFB, Ohio, SEL values were modeled at various altitudes for the KC-135 (the military aircraft type assessed under the Proposed Action), military aircraft types that currently fly at Grant County IAP, and common civilian aircraft types (see **Table 3-2**). As shown in **Table 3-2**, the SEL decreases as the altitude of the aircraft increases. When compared to some of the military and civilian aircraft that currently fly at Grant County IAP and Spokane IAP the KC-135 is quieter. For example, at 300 feet above ground level (AGL) on departure, the SEL value of the KC-135 is about 101 dBA as compared to 112 dBA for the C-17 aircraft and 117 dBA for the B-747 aircraft.

Table 3-2. SEL Values of Aircraft Associated with the Proposed Action Compared to Other USAF and Civilian Aircraft

Altitude (feet above ground level)	Military Aircraft Type			Civilian Aircraft Type	
	<i>KC-135</i>	<i>C-17</i>	<i>EA-6B</i>	<i>B-747</i>	<i>DC-9</i>
	Decibels				
300	100.8	112.2	123.0	117.1	118.9
500	97.2	108.2	119.2	113.2	115.5
1,000	92.2	102.4	113.7	107.5	110.5
2,000	86.7	96.2	107.4	100.8	105.0
3,000	83.2	78.3	101.5	96.4	83.3
4,000	80.5	74.5	98.7	93.1	80.5

When aircraft operations occur in an area, it is important to understand that individual aircraft noise events are typically heard for only a few seconds. The instantaneous noise level is very low at the beginning and end of this period. As the aircraft approaches, the sound level increases to some maximum level depending on how close the aircraft comes to the receiver or individual on the ground. If an aircraft passes to the side of a person (or any receiver) at some distance, the maximum noise level experience would be lower, but the levels would be near that maximum for a longer period of time. For example, if a person were half a mile to the side, the noise level would be approximately 10 to 15 dBA lower than if the overflight were directly overhead. The SELs provided in **Table 3-2** include the aircraft being directly overhead at the altitudes shown. An aircraft 2 to 3 miles away might not be heard at all. Weather conditions, maintenance requirements, mission requirements, and other factors can cause variations in daily training activities. The likelihood of an aircraft flying over an individual noise receptor varies depending upon the type of airspace being flown. Typically, residences and cities are overflown at a minimum altitude of 1,000 feet AGL.

3.1.3.1 Proposed Action

3.1.3.1.1 Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure

Fairchild AFB. No new aircraft operations are proposed at Fairchild AFB under the Proposed Action. As discussed in **Section 2.1.2**, Runway 05/23 would be closed to aircraft activity, with the exception of helicopters, which would continue to utilize portions of the airfield areas during implementation of the Proposed Action. KC-135 aircraft would be temporarily relocated to Grant County IAP and Spokane IAP. Relocated aircraft would utilize existing facilities and ramp space at Grant County IAP and Spokane IAP. As a result of the decrease of aircraft operations at Fairchild AFB, no effects on the noise environment at Fairchild AFB are expected as a result of the Proposed Action.

Grant County IAP. Under the Proposed Action, KC-135 aircraft would be scheduled to conduct approximately 2,672 flying operations over 11 months at Grant County IAP. Approximately eight aircraft operations per day would be conducted. As previously discussed, the majority of the proposed daily aircraft operations (96.4 percent, or 54 operations) would be conducted during the day, and only 3.6 percent (2 operations) would be conducted at night (O’Connell 2009). Flight operations would be conducted primarily Monday to Friday and very rarely on weekends.

No significant impacts on the noise environment at Grant County IAP are expected as a result of the Proposed Action. Per FAA Order 1050.1E, the FAA AEM computer model was used to determine if significant noise impacts could result from implementation of the Proposed Action at Grant County IAP. Data concerning the current commercial, general aviation, and military aircraft operations at Grant County IAP and the proposed KC-135 operations were inputted into the AEM model. As shown in **Appendix D**, the addition of the proposed KC-135 operations to the existing flight operations at Grant County IAP would result in a 16.8 percent increase in the noise contour area. Since this is below the 17 percent threshold, the Proposed Action is expected to have no significant impact on noise sensitive areas and no further noise analysis is required. In addition, as shown in **Table 3-2**, KC-135 overflights would have an overall lower SEL than the other aircraft types in the region, either civilian or military.

Spokane IAP. Under the Proposed Action, KC-135 aircraft would be scheduled to conduct approximately 3,920 flying operations over 11 months at Spokane IAP. Approximately 16 aircraft operations per flying day would be conducted. As previously discussed, the majority of the proposed daily aircraft operations (87.5 percent, or 14 operations) would be conducted during the day, and only 12.5 percent (2 operations) would be conducted at night (O’Connell 2009). Flight operations would be conducted primarily Monday to Friday and very rarely on weekends.

No significant impacts on the noise environment at Spokane IAP are expected as a result of the Proposed Action. Per FAA Order 1050.1E, the FAA AEM computer model was used to determine if significant noise impacts could result from implementation of the Proposed Action at Spokane IAP. Data concerning the current commercial, general aviation, and military aircraft operations at Spokane IAP and the proposed KC-135 operations were inputted into the AEM model. As shown in **Appendix D**, the addition of the proposed KC-135 operations to the existing flight operations at Spokane IAP would result in a 8.9 percent increase in the noise contour area. Since this is below the 17 percent threshold, the Proposed Action is expected to have no significant impact on noise sensitive areas and no further noise analysis is required. In addition, as shown in **Table 3-2**, KC-135 overflights would have an overall lower SEL than the other aircraft types in the region, either civilian or military.

3.2 Air Quality

3.2.1 Definition of the Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these “criteria pollutants” in ambient air are expressed in units of parts per million (ppm), milligrams per cubic meter (mg/m^3), or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological “air basin,” and the prevailing meteorological conditions.

The CAA directed the U.S. Environmental Protection Agency (USEPA) to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$\text{PM}_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. **Table 3-3** presents the primary and secondary USEPA NAAQS.

Although O_3 is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered a regulated air pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. Ozone is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or “ O_3 precursors.” These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO_2 .

As authorized by the CAA, USEPA has delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in State Implementation Plans (SIPs) that must be developed by each state or local regulatory agency and approved by USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA.

In 1997, USEPA initiated work on new General Conformity rules and guidance to reflect the new 8-hour O_3 , $\text{PM}_{2.5}$, and regional haze standards that were promulgated in that year. The 1-hour O_3 standard will no longer apply to an area 1 year after the effective date of the designation of that area for the 8-hour O_3 NAAQS. The effective designation date for most areas was June 15, 2004. USEPA designated $\text{PM}_{2.5}$ nonattainment areas in December 2004, and finalized the $\text{PM}_{2.5}$ implementation rule in January 2005. No area in the state of Washington was identified as being nonattainment for the $\text{PM}_{2.5}$ standard.

Table 3-3. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Standard	
		Primary	Secondary
O ₃	1 Hour ^a	0.12 ppm	Same as Primary Standard
	8 Hours ^b	0.08 ppm (157 µg/m ³)	
	8 Hours	0.075 ppm ^g	
PM ₁₀	24 Hours ^c	150 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean ^d	----	
PM _{2.5}	24 Hours ^e	35 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean ^f	15 µg/m ³	
CO	8 Hours ^c	9.0 ppm (10 mg/m ³)	None
	1 Hour ^c	35 ppm (40 mg/m ³)	
NO ₂	Annual Arithmetic Mean	0.053 ppm (100 µg/m ³)	Same as Primary Standard
SO ₂	Annual Arithmetic Mean	0.03 ppm (80 µg/m ³)	0.5 ppm 1,300 µg/m ³ , 3-Hour averaging time
	24 Hours ^c	0.14 ppm (365 µg/m ³)	
Pb	Quarterly Average	1.5 µg/m ³	Same as Primary Standard

Source: USEPA 2009a

Notes: Parenthetical values are approximate equivalent concentrations.

- The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1 . As of June 15, 2005, USEPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact Areas.
- To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
- Not to be exceeded more than once per year.
- To attain this standard, the expected annual arithmetic mean PM₁₀ concentration at each monitor within an area must not exceed 50 µg/m³.
- To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³.
- To attain this standard, the 3-year average of the annual arithmetic mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.
- To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

On March 10, 2009, the USEPA issued a proposed rule for mandatory greenhouse gas (GHG) reporting from large GHG emissions sources in the United States. The proposed rule was published in the *Federal Register* on April 10, 2009. The purpose of the rule is to collect comprehensive and accurate data on carbon dioxide (CO₂) and other GHG emissions that can be used to inform future policy decisions. The

proposed rule would require reporting of GHGs including CO₂. Although GHGs are not currently regulated under the CAA, the USEPA has clearly indicated that GHGs emissions and climate change are issues that need to be considered in future planning. GHGs are produced by the burning of fossil fuels and through industrial and biological processes.

Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A major stationary source is a facility (i.e., plant, installation, or activity) that has the potential to emit more than 100 tons per year (tpy) of any one criteria air pollutant, 10 tpy of a hazardous air pollutant (HAP), or 25 tpy of any combination of HAPs.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be “significant” if (1) a proposed project is within 10 kilometers of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 µg/m³ or more [40 CFR 52.21(b)(23)(iii)]. PSD regulations also define ambient air increments, limiting the allowable increases to any area’s baseline air contaminant concentrations, based on the area’s designation as Class I, II, or III [40 CFR 52.21(c)]. Because Fairchild AFB is not within 10 kilometers of a Class I area, PSD regulations do not apply and are not discussed further in this EA.

3.2.2 Description of Affected Environment

3.2.2.1 Fairchild AFB

Spokane County is within the Eastern Washington-Northern Idaho Interstate (EWNII) Air Quality Control Region (AQCR). The EWNII AQCR consists of the counties of Adams, Asotin, Columbia, Garfield, Grant, Lincoln, Spokane, and Whitman, Washington; and Benewah, Kootenai, Latah, Nez Perce, and Shoshone, Idaho. Portions of Spokane County, which include the Spokane Urban Area as defined by the Washington Department of Transportation, are designated as maintenance areas for CO. Fairchild AFB is not in the Spokane Urban Area. Portions of Spokane County are designated as maintenance for PM₁₀ (USEPA 2009b); however, Fairchild AFB is west of this maintenance area as defined in 40 CFR 81.348. Fairchild AFB and surrounding area are in attainment for all criteria pollutants.

The most recent emissions inventories for Spokane County and the EWNII AQCR are shown in **Table 3-4**. Spokane County is considered the local area of influence, and the EWNII AQCR is considered the regional area of influence for the air quality analysis.

The U.S. Department of Energy, Energy Information Administration, estimates that in 2005 gross CO₂ emissions in Washington were 83.8 million metric tons (DOE/EIA 2005).

Table 3-4. Local and Regional Air Emissions Inventory for Spokane County (2002)

	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
Spokane County, Washington	18,632	29,546	150,974	1,400	21,691	5,671
EWNII AQCR	51,880	74,049	386,986	3,984	154,732	28,185

Source: USEPA 2002

Washington State Department of Ecology (WDE) regulates air quality for the State of Washington. The Spokane Regional Clean Air Agency (SRCAA) is the air pollution control authority for Spokane County.

Fairchild AFB is classified as a synthetic minor source with the SRCAA. There are various sources on-installation that emit criteria pollutants and HAPs, including emergency generators, boilers, hot water heaters, fuel storage tanks, gasoline service stations, surface coating and miscellaneous chemical usage. As required by the SRCAA, Fairchild AFB calculates annual criteria pollutant emissions from stationary sources and provides this information to the SRCAA. **Table 3-5** summarizes the calendar year 2007 air emission inventory for Fairchild AFB.

Table 3-5. Calendar Year 2007 Air Emissions Inventory for Fairchild AFB

	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)
2007 Actual Emissions	10.6	10.2	4.5	0.2	1.1

Source: FAFB 2008k

3.2.2.2 Grant County IAP

Grant County IAP is in Moses Lake, Washington within Grant County. Grant County IAP is within the EWNII AQCR. The Eastern Regional Office of the WDE is the air pollution control authority for Grant County. Grant County IAP and surrounding area are in attainment for all criteria pollutants.

The most recent emissions inventories for Grant County and the EWNII AQCR are shown in **Table 3-6**. Grant County is considered the local area of influence, and the EWNII AQCR is considered the regional area of influence for the air quality analysis.

Table 3-6. Local and Regional Air Emissions Inventory for Grant County (2002)

	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
Grant County, Washington	5,367	6,647	45,982	383	15,986	2,682
EWNII AQCR	51,880	74,049	386,986	3,984	154,732	28,185

Source: USEPA 2002

3.2.2.3 Spokane IAP

Spokane IAP is in Spokane, Washington within Spokane County and within the EWNII AQCR. Spokane IAP is also within the boundaries of the Spokane Urban Area as defined by the USEPA and the Washington Department of Transportation (USEPA 2009b and SRCAA 2004). The Spokane Urban Area is designated as maintenance for CO and PM₁₀ (USEPA 2009b) as defined in 40 CFR 81.348. Spokane IAP and surrounding area are in attainment for all other criteria pollutants.

3.2.3 Environmental Consequences

The Federal *de minimis* threshold emissions rates were established by USEPA in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to substantially affect air quality. **Table 3-7** presents these thresholds, by regulated pollutant. As shown in **Table 3-5**, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

Table 3-7. Conformity *de minimis* Emissions Thresholds

Pollutant	Status	Classification	<i>de minimis</i> Limit (tpy)
O ₃ (measured as NO _x or VOCs)	Nonattainment	Extreme Severe Serious Moderate/marginal (inside ozone transport region) All others	10 25 50 50 (VOCs)/100 (NO _x) 100
	Maintenance	Inside ozone transport region Outside ozone transport region	50 (VOCs)/100 (NO _x) 100
CO	Nonattainment/ maintenance	All	100
PM ₁₀	Nonattainment / maintenance	Serious Moderate Not Applicable	70 100 100
PM _{2.5} (measured directly, as SO ₂ , or as NO _x)	Nonattainment/ maintenance	All	100
SO ₂	Nonattainment/ maintenance	All	100
NO _x	Nonattainment/ maintenance	All	100

Source: 40 CFR 93.153

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS “attainment” areas would be considered significant if the net increases in pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory
- Exceed any Evaluation Criteria established by a SIP.

Effects on air quality in NAAQS “nonattainment” areas are considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP.

With respect to the General Conformity Rule, impacts on air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area’s emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions

exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area.

In addition to the *de minimis* emissions thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 µg/m³ or more (40 CFR 52.21(b)(23)(iii)).

3.2.3.1 Proposed Action

3.2.3.1.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

Short-term, minor, adverse impacts would be expected from construction emissions and land disturbance. The Proposed Action would result in minor impacts on regional air quality during construction activities, primarily from site-disturbing activities and operation of construction equipment. Appropriate fugitive dust control measures would be employed during construction activities to suppress emissions. All emissions associated with construction operations would be temporary in nature. The proposed project includes a concrete batch plant, HMA batch plant, and two rock crushers. It is not expected that emissions from the Proposed Action would contribute to or affect local or regional attainment status with the NAAQS. Emissions from the proposed project are summarized in **Table 3-8**. Emission calculation spreadsheets and summary of the methodology used are included in **Appendix C**. HAP emission estimates for the concrete batch plant and HMA batch plant are also included in **Appendix C**.

Table 3-8. Estimated Air Emissions Resulting from Construction Activities

Activity	NO _x tpy	VOC tpy	CO tpy	SO ₂ tpy	PM ₁₀ tpy	PM _{2.5} tpy	CO ₂ tpy
Construction Combustion	80.916	4.888	32.292	1.853	4.946	4.797	9,479.50
Construction Fugitive Dust	--	--	--	--	204.403	18.693	--
Concrete Batching	--	--	--	--	4.953	--	--
Rock Crushing	--	--	--	--	0.191	0.024	--
Asphalt Batching	0.119	0.039	1.910	0.022	21.483	1.289	176.64
Haul Truck On-Road	3.778	2.732	11.101	0.298	4.493	1.168	956.40
Construction Commuter	0.275	0.274	2.479	0.003	0.026	0.016	328.71
Total Proposed Action Emissions in 2010	85.09	7.93	47.78	2.18	240.49	25.99	10,941
Percent of EWNII Inventory	0.164%	0.011%	0.012%	0.055%	0.155%	0.092%	NA

The construction project would generate particulate matter emissions as fugitive dust from ground-disturbing activities (e.g., runway demolition, paving, and construction), as well as rock crushing and concrete batch plant operations. Appropriate fugitive dust control measures would be employed during construction activities to suppress emissions. Emissions of all criteria pollutants would result from the asphalt batch plant; combustion of fuels from on-road haul trucks bringing raw materials for the concrete, asphalt, and drainage layer; as well as construction commuter emissions.

Fugitive dust emissions would be greatest during initial site preparation activities and would vary from day-to-day depending on the construction phase, level of activity, and prevailing weather conditions. The

quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Fugitive dust emissions for various construction activities were calculated using emissions factors and assumptions published in USEPA AP-42. These estimates assume that the project duration is 10 months or 200 working days for construction. Emission calculations and methodology used are included in **Appendix C**.

The SRCAA may require a Notice of Construction for the portable rock crushers, portable asphalt plant, and portable concrete plant for the proposed project if they have not previously operated in Spokane County. Thereafter, an approved Notice of Intent to Install and Operate a Temporary Stationary Source is required. Additional permitting may be required if the sources remain onsite for more than 12 consecutive months (SRCAA 2007). A source requiring a Notice of Construction requires a toxic air pollutant review, as described in Washington Administrative Code (WAC) 173-460, *Controls for New Sources of Toxic Air Pollutants*. The SRCAA may require a toxic air pollutant review in accordance with WAC 173-460 and dispersion modeling may be required to demonstrate compliance for pollutants exceeding small quantity emission rate (SQER) thresholds. The SQER is defined in WAC 173-460-020 as a level of emissions below which dispersion modeling is not required to demonstrate compliance with acceptable source impact levels. SQERs are listed in WAC 173-460-150. Toxic air pollutant emissions estimated for the concrete batch plant and HMA batch plant are included in **Appendix C**. The SRCAA may require a toxic air pollutant review in accordance with WAC 173-460 for any new source emitting toxic air pollutants.

The Energy Information Administration estimates that in 2005 gross CO₂ emissions in Washington were 83.8 million metric tons (DOE/EIA 2005). Approximately 9,924 metric tons of CO₂ (10,941 tons) were estimated to be emitted by the proposed project in 2010, which is approximately 0.001 percent of the Washington statewide CO₂. Therefore, the proposed project would have negligible contribution towards the Washington statewide GHG inventory. CO₂ emission estimates are included in **Appendix C**.

Since Fairchild AFB is in attainment for all criteria pollutants, General Conformity Rule requirements are not applicable. The Proposed Action would generate emissions well below 10 percent of the emissions inventory for the EWNII AQCR and the emissions would be short-term. Therefore, the demolition and construction activities associated with the Proposed Action would not have significant impacts on air quality at Fairchild AFB or on regional or local air quality. **Appendix C** includes the air emission calculations.

3.2.3.1.2 Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure

Grant County IAP. Short-term, minor, adverse impacts on local air quality would be expected to occur as a result of the aircraft emissions associated with the Proposed Action. As shown in **Table 2-2**, implementation of the Proposed Action would temporarily increase the total number of annual operations flown at Grant County IAP by approximately 3.8 percent. Emissions would continue to be generated by Grant County IAP activities such as aircraft operations, maintenance activities, industrial processes, fueling operations, and on-site stationary sources. It is anticipated that emissions from these activities would continue at baseline conditions, which do not exceed regional emissions or SIP thresholds.

Aircraft-specific data and emissions factors from the U.S. Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis (IERA) publication entitled *Air Emissions Inventory Guidance for Mobile Sources at Air Force Installations* (IERA 2002) were used to estimate the temporary increase in air emissions from the Proposed Action. Estimated annual emissions in tons per year from the proposed increase in airspace operations are shown in **Table 3-9**. As shown in **Tables 3-9**, emissions from the Proposed Action would be less than 10 percent of the emissions inventory for the EWNII AQCR (USEPA 2002). A detailed description of air emissions from the Proposed Action is provided in **Appendix C**.

Table 3-9. Estimated Air Emissions Resulting from Aircraft Activities at Grant County IAP

Activity	NO _x tpy	VOC tpy	CO tpy	SO ₂ tpy	PM _{10/2.5} tpy
Aircraft Emissions	71.82	1.84	71.46	7.58	23.75
<i>de minimis</i> Threshold	NA	NA	NA	NA	NA
Percent of EWNII Inventory	0.138%	0.002%	0.018%	0.190%	0.015%

Since Grant County is in attainment for all criteria pollutants, General Conformity Rule requirements are not applicable. The Proposed Action would generate emissions well below 10 percent of the emissions inventory for the EWNII AQCR and the emissions would be short-term. Therefore, the proposed temporary increase in aircraft operational activities associated with the Proposed Action would not have significant impacts on air quality at Grant County IAP or on regional or local air quality.

Spokane IAP. Short-term, minor, adverse impacts on local air quality would be expected to occur as a result of the aircraft emissions associated with the Proposed Action. As shown in **Table 2-2**, implementation of the Proposed Action would temporarily increase the total number of annual operations flown at Spokane IAP by approximately 1.4 percent. Overall, there would be a decrease in aircraft emissions in Spokane County during Runway 05/23 closure since aircraft normally operating out of Fairchild AFB would be temporarily relocated to other locations. Emissions would continue to be generated by Spokane IAP activities such as aircraft operations, maintenance activities, industrial processes, fueling operations, and on-site stationary sources. It is anticipated that emissions from these activities would continue at baseline conditions, which do not exceed regional emissions and SIP thresholds.

Estimated annual emissions from the proposed increase in airspace operations are shown in **Table 3-10**. As shown in **Tables 3-10**, emissions from the Proposed Action would not exceed the *de minimis* thresholds for Spokane County and would be less than 10 percent of the regional emissions inventory for the EWNII AQCR (USEPA 2002). A detailed description of air quality emissions from the Proposed Action is provided in **Appendix C**.

Table 3-10. Estimated Air Emissions Resulting from Aircraft Activities at Spokane IAP

Activity	NO _x tpy	VOC tpy	CO tpy	SO ₂ tpy	PM _{10/2.5} tpy
Aircraft Emissions	22.01	0.88	30.73	2.53	10.23
<i>de minimis</i> Threshold	NA	NA	100	NA	100
Percent of EWNII Inventory	0.042%	0.001%	0.008%	0.064%	0.007%

Since the Spokane IAP is within the Spokane Urban Area, which is in maintenance for CO and PM₁₀, General Conformity Rule requirements are applicable. The Proposed Action would generate emissions below *de minimis* threshold levels for CO and PM₁₀ and would be well below 10 percent of the regional emissions inventory for the EWNII AQCR. In addition, emissions from proposed aircraft operations would be short-term. Therefore, the proposed temporary increase in aircraft operational activities associated with the Proposed Action would not have significant impacts on air quality at Spokane IAP or on regional or local air quality. No General Conformity Determination is required since the emissions

associated with the aircraft operations under the Proposed Action would be below *de minimis* thresholds and well below 10 percent of the emissions inventory for EWNII AQCR.

3.2.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23, replace associated airfield lighting systems, or temporarily relocate aircraft, personnel, and equipment to other locations. Conditions would remain as described in **Section 3.1.2**. Therefore, no impacts on local or regional air quality would be expected.

3.3 Geological Resources

3.3.1 Definition of the Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards and paleontology.

Topography and physiography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water. The intent of the FPPA is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The Act also ensures that Federal programs are administered in a manner that, to the extent practicable, will be compatible with private, state, and local government programs and policies to protect farmland.

The implementing procedures of the FPPA and Natural Resources Conservation Service (NRCS) require Federal agencies to evaluate the adverse impacts (direct and indirect) of their activities on prime and unique farmland, as well as farmland of statewide and local importance, and to consider alternative actions that could avoid adverse impacts. Determination of whether an area is considered prime or unique farmland and potential impacts associated with a proposed action is based on preparation of the farmland conversion impact rating form AD-1006 for areas where prime farmland soils occur and by applying criteria established at Section 658.5 of the FPPA (7 CFR 658). The NRCS is responsible for overseeing compliance with the FPPA and has developed the rules and regulations for implementation of the Act (see 7 CFR Part 658, 5 July 1984).

3.3.2 Description of Affected Environment

3.3.2.1 Fairchild AFB

Regional Geology. The Spokane region is within the northernmost extent of the Miocene-aged Columbia Plateau lava flows. Layers of basalt could be as much as 500 feet thick with gravel, silt, or pyroclastic deposits interbedded. During the Pleistocene (from 1.8 million to 10,000 years before present), a series of floods from glacial ice dam failures on the Clark Fork River in Montana flooded much of Spokane. Floodwaters dispersed across the Columbia Plateau, scouring the landscape, widening the Spokane River valley, and depositing up to 500 feet of alluvium.

Bedrock in the Spokane area is composed of Precambrian-aged metamorphic gneiss, which is intruded into by the Mount Spokane pluton, consisting of quartz monzonite to granite, including pegmatites (i.e., large mineral crystals) with abundant garnets present. The Latah formation lies unconformably atop the bedrock and is composed of weakly lithified sedimentary deposits from a Miocene-aged shallow lake. The Columbia River Basalts were deposited on top of the Latah formation, with lava flowing from fissures south of Spokane (SCC 2009). The uppermost portion of regional geology of Spokane are the unconsolidated Pleistocene-aged Missoula flood deposits, which are composed primarily of gravels and sands (FAFB 2007c). This formation houses the Spokane aquifer, the sole source of drinking water for Spokane (discussed in **Section 3.3**) (SCC 2009).

Topography. Fairchild AFB is at the eastern edge of the Columbia Basin physiographic province, with a generally flat topography and an average elevation of 2,340 feet above mean sea level. Although the topography of Fairchild AFB is nearly level to undulating, the installation is surrounded by north-south trending mountain ranges. The Cascade mountain range is 180 miles west of the installation, and the Selkirk Mountains and Okanogan and Kettle River Ranges are north of the installation. They connect to the Cascades to the west and to the Rocky Mountains to the east. The Bitterroot Range of the Rocky Mountains is 90 miles east of Fairchild AFB and the Blue Mountains are 100 miles south of the installation (FAFB 2007c).

Soils. Soils at Fairchild AFB are derived from glaciofluvial materials. Soil series mapped on Fairchild AFB are the Cheney, Uhlig, Bong, Phoebe, Cocolalla, and unnamed shallow and very shallow soils. Primary soil compositions underlying the site of the Proposed Action include silty loams with varying amounts of ash, sand, and cobbles (FAFB 2005c). **Table 3-11** lists soils mapped at the proposed sites, as well as any engineering limitations. Soils were rated for engineering limitations that may impact the Proposed Action using the NRCS Web Soil Survey for construction of buildings, shallow excavations, and qualification for prime farmland classification. None of the soils mapped at the site of the Proposed Action are classified as hydric soils (soils typically associated with wetlands) (NRCS 2009).

The Caldwell silt loam has been rated as very limited for building construction due to flooding and shrink-swell potential. The Bong and Phoebe fine sandy loam, and both of the Cheney and Uhlig series have been rated as very limited for shallow excavations. This is due to the potential for cutbacks to cave in. As excavation activities are proposed to occur in the Bong and Phoebe fine sandy loam and the Cheney and Uhlig silt loams, best management practices (BMPs) should be implemented during construction to minimize the potential for a cave in. Expansion of Building 2014 would occur within the Bong and Phoebe fine sandy loam, which has no limits for building construction (NRCS 2009).

Prime Farmland. All five of the soil series mapped within the site of the Proposed Action are considered prime farmland soils to varying degrees (NRCS 2009). The Bong and Phoebe fine sandy loam is considered a prime farmland soil if irrigated, and the Caldwell silt loam is considered prime farmland soil

Table 3-11. Properties of Soils Mapped at the Sites of the Proposed Action

Map Unit Name and Texture	Slope (percent)	Farmland Classification	Drainage	Permeability	Building Limitations	Excavation Limitations
Bong and Pheobe fine sandy loam	0 to 8	I	Somewhat excessive	Moderately rapid	N	V
Caldwell silt loam	0 to 3	D	Poor	Moderately slow	V	S
Cheney and Uhlig silt loams	0 to 8	St	Well-drained	Moderate	S	V
Cheney-Uhlig complex	0 to 8	St	Well-drained	Moderate	N	V
Uhlig silt loam	0 to 5	P	Well-drained	Moderate	N	S

Source: FAFB 2005c, NRCS 2009

Key:

P = prime farmland

I = prime farmland if irrigated

D = prime farmland if drained

St = farmland of statewide importance

N = not limited

S = somewhat limited

V = very limited

if drained. However, irrigation and draining is not planned for the site of the Proposed Action. Therefore, these soils would not be considered prime farmland. Soils considered farmland soils of statewide importance (e.g., the Cheney and Uhlig series) are classified as those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. The Uhlig silt loam is considered a prime farmland soil. The location of the Proposed Action is an active runway, so it is not available for agricultural use, and the site would not meet the criteria for designation as prime farmland.

Geologic Hazards. Geologic hazards are defined as a natural geologic event that can endanger human lives and threaten property. Examples of geologic hazards include earthquakes, landslides and sinkholes. In Spokane, the primary geologic hazard that could potentially endanger lives or threaten property is earthquakes.

The U.S. Geological Survey (USGS) has produced maps of seismic hazard areas based on current information about the rates at which earthquakes occur in different areas and on how far strong shaking extends from the quake source. Shaking is expressed as a percentage of the force of gravity (percent g) and is proportional to the hazard faced by a particular type of building. The hazard maps show the areas where the estimated percent g for that region have a 2 percent chance of being exceeded in a 50-year period. The region of Fairchild AFB has a seismic hazard rating of approximately 15 percent g. In general, little or no damage is expected at values less than 10 percent g, moderate damage could occur at 10 to 20 percent g, and major damage could occur at values greater than 20 percent g (USGS 2009).

3.3.3 Environmental Consequences

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating the potential impacts of a proposed

action on geological resources. Generally, adverse impacts can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development.

Effects on geology and soils would be significant if they would alter the lithology, stratigraphy, and geological structures that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure, or function (including prime farmland and other unique soils) within the environment.

3.3.3.1 Proposed Action

3.3.3.1.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

Short-term and long-term, negligible to minor, adverse impacts on geology and soils would be expected from implementing the Proposed Action. Short-term, negligible to minor, adverse impacts would be expected from trenching activities associated with placement of utilities, creation of duct banks, addition of signage, and replacement of lighting equipment. Trenching would involve removal of vegetation and disturbance of soil structure. Removal of vegetation would temporarily increase potential for erosion and sedimentation until revegetation has occurred. Once vegetation has been reestablished, impacts from trenching activities would be reduced to long-term, negligible. **Section 3.4** provides a discussion on vegetation. A temporary increase in use of the haul route by construction equipment would result in short-term, minor, adverse impacts on soils due to increased rates of erosion and sedimentation.

Long-term, negligible to minor, adverse impacts on soils would be expected as a result of disturbing existing soils due to expansion of Building 2014; construction of the staging and parking areas; and excavation for placement of utilities, duct banks, and new storm water pipes. These activities would include clearing of vegetation, paving, and grading. Clearing of vegetation would increase erosion and sedimentation potential. Encasing the duct banks in concrete would increase impervious surfaces, which could increase rates of soil erosion and sedimentation, as well as sheet flow velocity to nearby receiving water bodies (see **Section 3.3** for a discussion of water resources). As a result of implementing the Proposed Action, soils would be compacted, and soil structure disturbed and modified. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in disturbed areas and be eliminated in those areas within the footprint of building structures, roadways, or parking facilities. Loss of soil structure due to compaction from vehicle traffic could result in changes in drainage patterns. However, as most of the site has been disturbed previously, it is anticipated that implementation of the Proposed Action would have a long-term, minor, adverse impact on natural soil structure.

Soil erosion and sediment production would be minimized for all construction operations as a result of following an approved sediment and erosion control plan. Use of storm water control measures that favor reinfiltration would minimize the potential for erosion and sediment production resulting from future storm events.

Buildings and other structures would be constructed consistent with international building code requirements for development in regions with seismic activity. This would minimize potential for adverse impacts on human life associated with earthquakes and development in the area.

Geotechnical soil surveys would be conducted prior to implementation of the Proposed Action to determine the breadth and severity of any engineering limitations. Construction BMPs would be implemented to minimize soil erosion; therefore, no significant adverse impacts on the soils would be expected. BMPs could include installing silt fencing and sediment traps, applying water to disturbed soil, and revegetating disturbed areas as soon as possible after disturbance, as appropriate.

3.3.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23 or replace associated airfield lighting systems. Conditions would remain as described in **Section 3.2**. No impacts on geological resources or soils would be expected.

3.4 Water Resources

3.4.1 Definition of the Resource

Hydrology consists of the redistribution of water through the processes of evapotranspiration, surface runoff, and subsurface flow. Hydrology is influenced primarily by temperature and total precipitation that determine evapotranspiration rates, topography that determines rate and direction of surface flow, and soil and geologic properties that determine rate of subsurface flow and recharge to the groundwater reservoir. Groundwater consists of subsurface hydrologic resources. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations. Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.

Waters of the United States are defined within the Clean Water Act (CWA), as amended, and jurisdiction is addressed by the USEPA and the U.S. Army Corps of Engineers (USACE). These agencies assert jurisdiction over (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-around or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries. Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into waters of the United States, including wetlands. Encroachment into waters of the United States and wetlands requires a permit from the state and the Federal government.

The USACE, USEPA, and State of Washington regulations including the Shoreline Management Act and Washington State Growth Management Act (GMA) all define wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (Ecology 1997). The Shoreline Management Act and GMA definitions add: “Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate the conversion of wetlands” (Ecology and WDFW 2005).

The State Water Pollution Control Act and the Shoreline Management Act give the Washington Department of Ecology the authority to regulate wetlands. The Washington State GMA of 1990 (Revised Code of Washington [RCW] 36.70A) was passed to guide local jurisdictions in their decisions regarding land use. The GMA directs local governments to protect critical areas. As defined in Chapter 36.70A.030(5) RCW, “critical areas” include: wetlands, areas with a critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas. The GMA requires all counties and cities in Washington to adopt development regulations containing appropriate and specific criteria and standards to ensure protection of

designated critical areas. To “protect” critical areas means to maintain their values and functions so that there is no net loss of those values and functions. The required standard of protection should be to prevent adverse impacts or, at the very minimum, to mitigate adverse impacts (Ecology and WDFW 2005).

Some types of wetlands are regulated by state and local governments but not by the Federal government, the most common type of which is isolated wetlands. Isolated wetlands generally have no surface water connections to other aquatic resources (Ecology 2009). The current lack of regulation of many isolated wetlands by Federal agencies is the result of very different statutory language in the CWA that ties Federal regulation to navigable waters and interstate commerce (Ecology and WDFW 2005). Though not always protected under Federal law, isolated wetlands often perform many of the same important environmental functions as other wetlands, including recharging streams and aquifers, storing flood waters, filtering pollutants from water, and providing habitat. Therefore, these wetlands continue to be protected under State of Washington and local laws and rules (Ecology 2009). The State Water Pollution Control Act (Chapter 90.48 RCW) and associated water quality regulations (Chapter 173-201A WAC) make no distinction between isolated and non-isolated wetlands and all waters of the state, including isolated wetlands, are covered by state law. The Shoreline Management Act and the GMA also regulate isolated wetlands (Ecology 2009).

3.4.2 Description of Affected Environment

3.4.2.1 Fairchild AFB

Groundwater. Fairchild AFB and the surrounding area are represented by varying depths of groundwater perched by hard basalt bedrock or lenses of clay in surficial glacial melt water deposits (FAFB 2007a). Perched water tables and relatively shallow soils overlying indurated bedrock create periods of the year where infiltration capacity is exceeded by precipitation or runoff, causing localized ponding. Ponded water and shallow water tables can be extensive in the southern portion of the installation from March to April (FAFB 2006b). Depths to groundwater range from 5 to 40 feet. Two deep aquifers are the primary source of water to surrounding communities, residences, and agriculture (FAFB 2007a).

Fairchild AFB’s main supply of water comes from the Hangman aquifer upstream from the Spokane River (FAFB 2007a). Fairchild AFB receives water from three wells at the Fort George Wright Annex. These wells feed the Geiger Reservoir near the Spokane IAP. Water is then piped to ground storage tanks on the installation. If water demand is not met, a seasonal well (Well #2) within the extreme southeast corner of the installation pumps water to the water distribution grid. The wells along the Spokane River have adequate capacity to supply the installation’s needs. The Bioenvironmental Engineering Flight (92 Aerospace Medicine Squadron) monitors drinking water quality weekly at various points throughout the installation, ensuring it meets required Federal and state health standards (FAFB 2006a).

Surface Water. Fairchild AFB is situated at the hydrologic head of three watershed basins, including the Lower Spokane River, Hangman Creek, and the Palouse River. Surface water on Fairchild AFB consists of several open drainage ditches, storm water detention ponds and swales, and isolated wetlands. The topography is nearly flat to undulating with no indication that surface runoff is conveyed by surface flow to stream channels within these watersheds. The primary function of surface water features on the installation is to provide temporary containment of storm water and facilitate groundwater recharge (FAFB 2007a). Surface water within the proposed project area consists of open drainage ditches within the airfield that parallel the runway to the north; and several isolated depressional wetlands or storm water detention ponds (FAFB 2005b, FAFB 2006b).

Floodplains. No regulatory floodplains exist on Fairchild AFB’s main installation (FAFB 2009d).

Wetlands. Fairchild AFB contains approximately 220 acres of wetlands of various levels of quality. All wetlands on Fairchild AFB are under Washington State Department of Ecology jurisdiction and are defined per USACE as isolated. The 2006 *Wetland Inventory* evaluated all wetlands against the Eastern Washington Wetland Rating System. Although most wetlands are considered a category III or IV, one wetland on Fairchild AFB is classified as category II (Dw-17) and two wetlands are classified as category I (Dw-18 and Dw-56) wetlands. Category I and II wetlands are more valuable and therefore require higher levels of protection (FAFB 2009d). Wetlands in operational areas of the installation used for storm water drainage tended to rank higher in water quality and hydrologic functions and low in habitat functions. Wetlands in less disturbed areas tend to rank higher in habitat function and lower in water quality and hydrologic functions (FAFB 2006b). Conservation and higher value depressional wetlands on Fairchild AFB generally include the vernal pool and adjacent areas (west/southwest), the extreme southwest corner (Dw-56 Complex), and the current wildlife viewing area wetlands/upland complex (FAFB 2006b).

All of the wetlands within Fairchild AFB are isolated depressions (both natural and constructed), constructed drainage ditches, or vernal pools. Most of the inventoried wetlands have undergone some degree of hydrologic alteration due to road and utility construction, compaction, or tillage from past agricultural uses, and ditching, which altered the plant community within these wetlands. All of the wetlands on Fairchild AFB are thought to be isolated, with the possible exception of the wetland complex in the southwest corner of the installation (Dw-56 Complex) that is part of a well-defined drainage corridor and associated wetlands complex extending northward from Silver Lake. **Figure 3-1** shows wetlands as delineated in the 2006 Wetland Inventory for Fairchild AFB. Although isolated, the depressional wetlands that are in good condition have local significance to groundwater regulation and wildlife habitat. One drainage ditch wetland area occurs within the proposed project area near the proposed staging area (Dw-8), and an additional drainage ditch wetland occurs on the western end of the runway within the proposed project area (Ditch 4-2). Several isolated depressional wetlands and drainage ditch wetlands exist in the airfield area south of the runway, just south of the proposed project area. Wetland Dw-53-1 immediately adjoins the proposed project area to the south (FAFB 2006b).

Storm Water. Fairchild AFB operates under a National Pollution Discharge Elimination System (NPDES) Storm Water Multi-Sector General Permit (#WAR05A025) and has a Storm Water Pollution Prevention Plan (SWPPP) (FAFB 2009d). The current storm water infrastructure is in compliance with all state and Federal storm water regulations (FAFB 2007a). The installation implements BMPs to limit contaminants in storm water runoff, and periodic samples are collected to verify compliance with NPDES permit conditions (FAFB 2009d).

As a result of the relatively flat topography, storm water runoff tends to disperse and infiltrate in unpaved areas (FAFB 2006b). Since a majority of precipitation infiltrates or evaporates in the localized topographic depressions, Fairchild AFB generates very little storm water runoff (FAFB 2008h). Storm water surface drainage across the proposed project area is generally diverted and conveyed in a southeastern direction (FAFB 2006b). Storm water on the installation drains to a passive treatment system of settling ponds prior to being routed to a drainage ditch on an adjacent agricultural field. Surface waters are infiltrated into soils within about 0.5 mile of the settling ponds (FAFB 2009d). Designed storm water facilities either use dispersal and infiltration of runoff where practical or direct runoff to collection and conveyance piping, catch basins, detention and/or infiltration ponds, swales, and ditches. Storm water sewer lines and drop inlets are throughout the airfield and cross under the runway and taxiways in the proposed project area. Storm water drainage from areas outside Fairchild AFB is also collected or blocked at the boundaries. No storm water drainage channels or wetlands appear to discharge via surface water to any offsite surface water bodies. Observed offsite drainages on the east and west boundaries appear to discharge to groundwater (FAFB 2006b).



Figure 3-1. Wetlands Delineated in Fairchild AFB's 2006 Wetland Inventory

3.4.3 Environmental Consequences

Evaluation criteria for impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action would have significant impacts on water resources if it were to do one or more of the following:

- Substantially reduce water availability or supply to existing users
- Overdraft of groundwater basins
- Exceed safe annual yield of water supply sources
- Substantially adversely affect water quality
- Endanger public health by creating or worsening health hazard conditions
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources.

The potential effect of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

3.4.3.1 Proposed Action

3.4.3.1.1 *Repairing Runway 05/23 and Replacing Airfield Lighting Systems*

Short-term, negligible to minor, adverse impacts on water quality would be expected from the Proposed Action. The Proposed Action would be expected to temporarily increase ground disturbances and exposed soils within the proposed project area; therefore, demolition and construction activities would have the potential to increase sedimentation in nearby drainage ditches and depressional wetlands from storm water runoff. However, proper implementation of BMPs and adherence to the SWPPP as part of the project design would prevent any adverse impacts on nearby wetlands or drainage ditches. As a USAF and Fairchild AFB standard, a site-specific SWPPP would be developed in accordance with USEPA construction storm water permit regulations for all construction activities and would minimize adverse impacts on water resources. No construction would occur within the boundaries of the wetlands within or adjoining the proposed project area.

Conveyance of nonpoint source pollutants in runoff to offsite water bodies would not be expected, as storm water runoff is generally not generated from Fairchild AFB and no storm water drainage channels or wetlands discharge via surface water to any offsite surface water bodies (FAFB 2007a).

Long-term, negligible to minor, beneficial impacts on water resources would be expected from the Proposed Action due to a decrease in impervious surfaces, as the runway width would be reduced and Building 1101 would be demolished. A decrease in impervious surfaces provides more ground surface for groundwater recharge and less storm water runoff and demand on storm water infrastructure.

3.4.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23 or replace associated airfield lighting systems. Conditions would remain as described in **Section 3.3.2**. No new impacts on water resources would be expected.

3.5 Biological Resources

3.5.1 Definition of the Resource

Biological resources include native or naturalized plants and animals, and the habitats in which they exist. This section describes the affected environment and environmental consequences for vegetation, native wildlife, and protected and sensitive species known or likely to occur within the proposed project area.

Protected and sensitive biological resources include federally listed (endangered or threatened), proposed, and candidate species, and designated or proposed critical habitat; species protected under other Federal laws (see **Appendix A**); species of concern managed under Conservation Agreements or Management Plans; and state-listed species. Under the Endangered Species Act (ESA) (16 U.S.C. 1536), an “endangered species” is defined as any species in danger of extinction throughout all or a significant portion of its range. A “threatened species” is defined as any species likely to become an endangered species in the foreseeable future. The U.S. Fish and Wildlife Service (USFWS) also maintains a list of species considered to be candidates for possible listing under the ESA. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and might warrant protection under the Act.

The Washington Endangered, Threatened, and Sensitive Wildlife Species Classification Rule (WAC 232-12-297) identifies and classifies native wildlife species that have need of protection or management to ensure their survival as free-ranging populations in Washington and to define the process by which listing, management, recovery, and delisting of a species can be achieved. The rule defines endangered wildlife species as “any wildlife species native to Washington that is seriously threatened with extinction throughout all or a significant portion of its range in the state.” Threatened species are defined as “any wildlife species native to the state of Washington that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats.” Sensitive species are defined as “any wildlife species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened in a significant portion of its range within the state without cooperative management or removal of threats” (WDFW 1990).

3.5.2 Description of Affected Environment

3.5.2.1 Fairchild AFB

Vegetation. The development of the installation has led the replacement of the historic native vegetative cover with non-native plants (FAFB 2009d). Most of the vegetation along the airfield is dominated by a mix of pasture grasses and associated agricultural weeds. These areas are relatively uniform swaths of grasses not native to North America, with a low diversity of plants. Old fields have a low diversity of plants, although some aggressive native species might be present (FAFB 2005b). Airfield grasses are mowed regularly in accordance with Fairchild AFB’s Bird/Wildlife Aircraft Strike Hazard (BASH) Reduction Plan and maintained at heights between 7 and 14 inches (FAFB 2008e). In general, most of the undeveloped habitat on Fairchild AFB occurs in the southern half of the installation (FAFB 2009d). Common cattail (*Typha latifolia*) and rushes (*Juncus* spp.) grow in isolated wetland areas with more permanent water (FAFB 2005b).

Wildlife. Much of the undeveloped natural habitat on Fairchild AFB occurs in the southern portion of the installation, which contains a mixture of disturbed and semi-native wetlands, open grass and shrub land, and two small patches of ponderosa pine woodland. The northern portion of the installation is developed and contains habitats and species typical of urban areas (FAFB 2009d). The airfield area consists of a

paved runway, paved roadways, facilities associated with the runway, and maintained grassland. Vegetation near the runway has been managed to minimize avian use in accordance with the BASH Reduction Plan. The airfield is mowed regularly to reduce attractiveness to birds. Additionally, broad-leaved plants, shrubs, and landscaping plants are kept out of the airfield environment in order to prevent habitat diversity and wildlife attraction within the airfield. Seasonal water in drainage ditches and the large open fields adjacent to the paved runway provide some habitat value; however, this area is considered to be of low value to wildlife and wildlife is not encouraged in this area (FAFB 2005b).

Any wildlife species with potential to occur within the project area are assumed to be transient species, moving from one habitat to another. There is minimal habitat to support wildlife species within the proposed project area, and the existing level of human activity within the vicinity would generally preclude most wildlife from utilizing the proposed project area as habitat. Airfield grassland areas can provide potentially suitable habitat for birds such as the grasshopper sparrow (*Ammodramus savannarum*) and savannah sparrow (*Passerculus sandwichensis*). Other bird species with potential to cross the proposed project area include the song sparrow (*Melospiza melodia*), brown-headed cowbird (*Molothrus ater*), American goldfinch (*Carduelis tristis*), killdeer (*Charadrius vociferous*), rock dove (*Calumbalivia*), mourning dove (*Zenaida macroura*), western meadowlark (*Sturnella neglecta*), turkey vulture (*Cathartes aura*), several species of gulls (*Larus* spp.), and several species of raptors (e.g., red-tailed hawk [*Buteo jamaicensis*], Swainson's hawk [*Buteo swainsoni*], rough-legged hawk [*Buteo lagopus*], northern harrier [*Circus cyaneus*], American kestrel [*Falco sparverius*], prairie falcon [*Falco mexicanus*], burrowing owl [*Athene cunicularia*], short eared owl [*Asio flammeus*], and great horned owl [*Bubo virginianus*]) (FAFB 2005b).

Birds species that might breed locally within the marshy and stream areas on the installation include the northern rough-winged swallow (*Stelgidopteryx serripennis*), willow flycatcher (*Empidonax traillii*), western kingbird (*Tyrannus verticalis*), cedar waxwing (*Bombicilla cedrorum*), common yellowthroat (*Geothlypis trichas*), and red-winged blackbird (*Agelaius phoeniceus*) (FAFB 2005b). This region is an important breeding and resting ground for migrating waterfowl (FAFB 2005b). Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*), northern pintail (*Anas acuta*), green-winged teal (*Anas crecca*), and ruddy ducks (*Oxyura jamaicensis*) are known to enter Fairchild AFB's runway environment (FAFB 2005b). These waterfowl species are harassed on a routine basis per Fairchild AFB's BASH Reduction Plan in order to prevent nesting and habitation by these species near the runway environment.

Mammals observed entering the airfield area include the coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), American badger (*Taxidea taxus*), Nuttall's cottontail (*Sylvilagus nuttallii*), and yellow-bellied marmot (*Marmota flaviventris*) (FAFB 2008e). Other species with potential to enter the airfield area include the raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), white-tailed jackrabbit (*Lepus townsendii*), Washington ground squirrel (*Spermophilus washingtoni*), golden-mantled ground squirrel (*Spermophilus lateralis*), Columbian ground squirrel (*Spermophilus columbianus*), northern pocket gopher (*Thomomys talpoides*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), long-tailed vole (*Microtus longicaudus*), montane vole (*Microtus montanus*), and meadow vole (*Microtus pennsylvanicus*) (FAFB 2005b). The vagrant shrew (*Sorex vagrans*) has been observed on Fairchild AFB and might occur within the marshy areas adjacent to the proposed project area (FAFB 2005b).

Extensive herptile surveys have not been conducted at Fairchild AFB. Herptiles with potential to occur at Fairchild AFB were identified within Fairchild AFB's *Integrated Natural Resources Management Plan* by examining range maps of these species. The airfield grassland areas at Fairchild AFB could provide suitable habitat for amphibians such as the long-toed salamander (*Ambystoma macrodactylum columbianum*), blotched tiger salamander (*Ambystoma tigrinum melanostictum*), Great Basin spadefoot toad (*Scaphiopus intermontanus*), boreal toad (*Bufo boreas boreas*), pacific treefrog (*Hyla regilla*), and

northern leopard frog (*Rana pipiens*). Airfield grassland areas have potential to provide suitable habitat for reptiles including the short-horned lizard (*Phrynosoma douglasii*), Skilton skink (*Eumeces skiltonianus skiltonianus*), northwestern alligator lizard (*Gerrhonotus coeruleus principis*), Rocky Mountain rubber boa (*Charina bottae utahensis*), western yellow-bellied racer (*Coluber constrictor mormon*), Great Basin gopher snake (*Pituophis melanoleucus deserticola*), valley garter snake (*Thamnophis sirtalis fitchi*), wandering garter snake (*Thamnophis elegans vagrans*), and northern pacific rattlesnake (*Crotalus viridis oreganus*) (FAFB 2005b).

Protected and Sensitive Species. Nine Federal- or state-listed species have been previously observed on Fairchild AFB, including the bald eagle (*Haliaeetus leucocephalus*), state-listed as threatened; burrowing owl (*Athene cunicularia*), a Federal species of concern and state candidate for listing; golden eagle (*Aquila chrysaetos*), a state candidate for listing; white-tailed jackrabbit, a state candidate for listing; Spalding's catchfly (*Silene spaldingii*), federally and state listed as threatened; American pillwort (*Pilularia americana*), state listed as threatened; inch-high rush (*Juncus uncialis*), state listed as sensitive; mousetail (*Myosurus clavicaulis*), state listed as sensitive; and northwestern yellowflax (*Sclerolinon digynum*), state listed as threatened (FAFB 2005b, USFWS 2009a). Several other protected and sensitive species have potential to cross Fairchild AFB due to occurrence in the region and available habitat on the installation; however, these species were not identified during threatened and endangered species surveys conducted by The Nature Conservancy in 1993 and 1994 (see **Table 3-12**). There is no USFWS-designated critical habitat within Spokane County or Grant County, including Fairchild AFB (USFWS 2009b).

Spalding's catchfly is the only federally listed species that has been identified on Fairchild AFB. It is predominantly found in moist bunchgrass grasslands and sage-brush-steppe. Spalding's catchfly was first identified on Fairchild AFB in 1994, and placed on the Federal list as threatened in 2001. This species occurs in the southwestern portion of Fairchild AFB (Spokane County 2007) and does not occur within the proposed project area. All other state-listed plant species that have been identified on Fairchild AFB, including the American pillwort, inch-high rush, mousetail, and northwestern yellowflax are associated with vernal pools and have no potential to occur within the proposed project area (FAFB 2005b). The burrowing owl has been observed foraging and nesting on the airfield in the past; however, no burrowing owls or their burrows (active or inactive) currently exist on Fairchild AFB. Based upon best-available information, there are no federally listed species known to exist or expected to exist within the proposed project area and no habitat to support federally listed species is known to exist or expected to exist within the proposed project area.

3.5.3 Environmental Consequences

Biological resources are evaluated in terms of compliance with Section 7 of the ESA and related laws and authorities. Emphasis is placed on species with legal, commercial, recreational, ecological, or scientific importance. Biological resources might be affected directly by ground disturbance or indirectly through such changes as increased construction noise. A habitat perspective is used to provide a framework for analysis of general classes of impacts on biological resources (i.e., removal of critical habitat, noise, human disturbance). Impacts on biological resources were assessed by evaluating the following:

- Potential for loss or alteration of suitable habitat and the proximity of similar habitat
- The proportion of the resource that would be affected relative to its occurrence in the region
- The sensitivity of the resource to proposed activities
- The duration of ecological impacts.

Table 3-12. Federal- and State-Protected and Sensitive Species Occurring on or in the Vicinity of Fairchild AFB

Common Name	Scientific Name	Federal Status	State Status
Birds			
American white pelican	<i>Pelicanus erythrorhynchus</i>	None	E
Bald eagle*	<i>Haliaeetus leucocephalus</i>	None	T
Burrowing owl*	<i>Athene cunicularia</i>	SOC	C
Common loon	<i>Gavia immer</i>	None	S
Golden eagle*	<i>Aquila chrysaetos</i>	None	C
Ferruginous hawk	<i>Buteo regalis</i>	SOC	T
Flammulated owl	<i>Otus flammeolus</i>	None	C
Lewis' woodpecker	<i>Melanerpes lewis</i>	None	C
Merlin	<i>Falco columbianus</i>	None	C
Northern goshawk	<i>Accipiter gentilis</i>	SOC	C
Peregrine falcon	<i>Falco peregrines</i>	SOC	S
Pileated woodpecker	<i>Drycopus pileatus</i>	None	C
Sage sparrow	<i>Amphispiza belli</i>	None	C
Sage thrasher	<i>Oreoscoptes monanus</i>	None	C
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	SOC	T
Vaux's swift	<i>Chaetura vauxi</i>	None	C
Western grebe	<i>Aechmophorous occidentalis</i>	None	C
Mammals			
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SOC	C
Washington ground squirrel	<i>Spermophilus washingtoni</i>	C	C
White-tailed jackrabbit*	<i>Lepus townsendii</i>	None	C
Amphibians			
Boreal toad	<i>Bufo boreas</i>	SOC	C
Columbia spotted frog	<i>Rana luteiventris</i>	SOC	C
Northern leopard frog	<i>Rana pipiens</i>	SOC	E
Invertebrates			
Juniper hairstreak	<i>Mitoura grynea barryi</i>	None	C
Mann's mollusk-eating ground beetle	<i>Scaphinotus mannii</i>	None	C
Shepherd's parnassian	<i>Parnassius clodius shepherdii</i>	None	C
Silver-bordered fritillary	<i>Boloria selene atrocotalis</i>	None	C

Common Name	Scientific Name	Federal Status	State Status
Plants			
American pillwort*	<i>Pilularia americana</i>	None	T
Austin's knotweed	<i>Polygonum austiniiae</i>	None	T
Black snake-root	<i>Sanicula marilandica</i>	None	S
Bristly sedge	<i>Carex comosa</i>	None	S
Canadian St. John's-wort	<i>Hypericum majus</i>	None	S
Dwarf rush	<i>Juncus hemiandytus</i> var. <i>hemiandytus</i>	None	T
Grand redstem	<i>Ammannia robusta</i>	None	T
Gray stickseed	<i>Hackelia cinerea</i>	None	S
Green keeled cotton-grass	<i>Eriophorum viridicarinatum</i>	None	S
Water howellia	<i>Howellia aquatilis</i>	T	T
Idaho gooseberry	<i>Ribes oxycanthoides</i> ssp. <i>irriguum</i>	None	S
Inch-high rush*	<i>Juncus uncialis</i>	None	S
Kidney-leaved violet	<i>Viola renifolia</i>	None	S
Lowland toothcup	<i>Rotala ramosior</i>	None	T
Marsh muhly	<i>Muhlenbergia glomerata</i>	None	S
Mousetail*	<i>Myosurus clavicaulis</i>	None	S
Northwestern yellowflax*	<i>Sclerolinon digynum</i>	None	T
Nuttall's pussy-toes	<i>Antennaria parvifolia</i>	None	S
Palouse goldenweed	<i>Haplopappus liatrifolius</i>	SOC	T
Prairie cordgrass	<i>Spartina pectinata</i>	None	S
Rocky Mountain bulrush	<i>Scirpus saximontanus</i>	None	T
Spalding's catchfly*	<i>Silene spaldingii</i>	T	T
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	T	E
Yellow lady's-slipper	<i>Cypripedium parviflorum</i>	None	T
Wilcox's penstemon	<i>Penstemon wilcoxi</i>	None	S

Source: FAFB 2005b, WDFW 2009, USFWS 2009a, USFWS 2009c

Note: * Species observed on Fairchild AFB

Key:

E = Endangered

C = Candidate

T = Threatened

S = Sensitive

SOC = Species of Concern

Under the ESA, Federal agencies are required to provide documentation that ensures that agency actions will not adversely affect the existence of any federally threatened or endangered species. The ESA requires that all Federal agencies avoid "taking" threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with concurrence on a determination of the risk of jeopardy from a Federal agency project.

3.5.3.1 Proposed Action

3.5.3.1.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

Vegetation. Short-term, negligible to minor, adverse impacts on vegetation would be expected. Construction activities primarily would occur within existing improved and disturbed areas along the runway and within the staging area on Taxiway K; therefore, no long-term, adverse impacts on vegetation from direct removal of plants would be expected. Incidental damage to adjoining vegetation could occur during demolition and construction activities; and from construction equipment travelling to and from the proposed project area, resulting in direct, short-term, negligible to minor, adverse impacts on vegetation. Additional areas disturbed as a result of project development would be replanted with approved grass mixtures following construction activities. The majority of vegetation within the proposed project area is composed of nonnative grasses; therefore, negligible adverse impacts on native vegetation would be expected.

Wildlife. Short-term, negligible to minor, adverse impacts on wildlife would be expected. Auditory, visual, and physical disturbances during demolition and construction activities would be expected to disrupt several wildlife species. During construction, there would be temporary increases in ambient noise levels and other disturbances. Noise would result from general construction activities including clearing, grading, excavation, jackhammering, drilling, and rock crushing; and noise associated with construction equipment moving to and from the proposed project area. Certain wildlife species adapted to noise and other disturbance levels associated with common activities on Fairchild AFB (e.g., aircraft use) would be expected to remain during construction or return to the area shortly after construction activities cease. Other species that do not solely use the proposed project area as habitat would be expected to avoid the area during demolition and construction. Wildlife species near the runway are assumed to be habituated to frequent and intense noise disturbances from aircraft using the runway. Cumulative disturbances from noise on wildlife would not be expected as the runway would be temporarily closed to aircraft during construction.

Protected and Sensitive Species. Of the nine Federal- and state-listed species previously identified on Fairchild AFB, two have been described as having potential to occur within the airfield, including the burrowing owl and white-tailed jackrabbit (FAFB 2005b); however, neither species has been observed on Fairchild AFB in recent years. The burrowing owl was observed to forage and nest on the airfield in the past; however, no burrowing owls or their burrows (active or inactive) currently exist on Fairchild AFB. Spalding's catchfly, the only federally listed species observed on the installation, occurs only in the southern portion of the installation; therefore, no threatened or endangered species would likely be impacted by the Proposed Action.

Based upon best-available information, there are no federally listed species known to exist or expected to exist within the proposed project area and no habitat to support federally listed species is known to exist or expected to exist within the proposed project area; therefore, no impacts on protected or sensitive species are expected by the implementation of the Proposed Action.

The *Migratory Bird Treaty Act of 1918* (16 U.S.C. 703–712) as amended, and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, require Federal agencies to minimize or avoid impacts on migratory birds listed in 50 CFR 10.13. If design and implementation of a Federal action cannot avoid measurable negative impacts on migratory birds, EO 13186 requires the responsible agency to consult with the USFWS and obtain a Migratory Bird Depredation Permit. Fairchild AFB currently maintains a Migratory Bird Depredation Permit from the USFWS (Permit No. MB683748-0).

All of the provisions and conditions of the governing regulations at 50 CFR Part 13 and 50 CFR Part 21.4 are conditions of the permit (FAFB 2009f). In addition, the following conditions and provisions should be followed:

- To minimize the lethal take of migratory birds, continual application of nonlethal methods of harassment in conjunction with lethal control is required.
- Shotguns used to take migratory birds can be no larger than 10-gauge and must be fired from the shoulder. Nontoxic shots listed in 50 CFR 20.21(j) must be used.
- Blinds, pits, or other means of concealment; and decoys, duck calls, or devices to lure or entice migratory birds into gun range may not be used.
- Fairchild AFB is not authorized to take, capture, harass, or disturb bald eagles, golden eagles, or species listed as threatened or endangered under the ESA without additional authorization (e.g., obtain a permit for limited take under the Bald and Golden Eagle Protection Act, as described in *Federal Register* Volume 74 Number 175 [September 11, 2009]).
- If a migratory bird with a Federal band issued by the USGS Bird Banding Laboratory is encountered, it must be reported to www.reportband.gov.
- The Depredation Permit does not authorize take or release of any migratory birds, nests, or eggs on Federal lands without additional prior written authorization from the applicable Federal agency.
- The Depredation Permit does not authorize take or release of any migratory birds, nests or eggs on state lands or other public or private property without prior written permission or permits from the landowner or custodian.
- Unless otherwise specified, migratory birds, nests, or eggs taken under the Depredation Permit must be either (1) turned over to the U.S. Department of Agriculture; (2) donated to a public educational or scientific institution, as defined by 50 CFR 10; or (3) completely destroyed by burial or incineration (FAFB 2009f).

3.5.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23 or replace associated airfield lighting systems. No impacts on biological resources would be expected.

3.6 Cultural Resources

3.6.1 Definition of the Resource

“Cultural resources” is an umbrella term for a variety of heritage or cultural-related resources that are considered under a number of Federal laws, regulations, executive orders, and other authorities. Cultural resources can include archaeological sites, buildings, structures, districts, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. Depending on their condition and historic use, such resources can provide insight into living conditions of previous existing civilizations, or might retain cultural and religious significance to modern groups. Typically, cultural resources are subdivided into archaeological resources (i.e., prehistoric or historic sites where human activity has left physical evidence of that activity but no aboveground structures remain standing) or architectural resources (i.e., buildings or other structures or groups of structures that are of historic or aesthetic significance). Archaeological resources comprise areas where human activity has measurably altered the earth or intact deposits of physical remains are found (i.e., prehistoric or historic habitation remains). Archaeological resources can also

include submerged resources, including resources that are submerged as a result of wreck or intentional submersion (e.g., shipwrecks), resources submerged as a result of reservoir construction, or resources that have become submerged through sea level rise.

Architectural resources include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered potentially eligible for nomination to the National Register of Historic Places (NRHP), as stated in National Register Bulletin 15. More recent structures, such as Cold War-era resources, might warrant protection if they are associated with exceptionally significant events or persons, represent remains that are so fragile that examples of any kind are extremely rare, or have the potential to gain significance in the future, as stated in National Register Bulletin 22.

Traditional Cultural Properties or sacred sites can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, or areas where particular plants, animals, or minerals exist that Native Americans or other cultural groups consider to be essential for the preservation of traditional cultural practices, as stated in National Register Bulletin 38.

NEPA and the CEQ regulations require consideration of the effects of Federal actions on all aspects of the “human environment,” which is defined as “the natural and physical (built) environment and the relationship of people with that environment” (40 CFR 1508.14). NEPA is coordinated with compliance with other legal authorities. Historic properties are afforded protection under the National Historic Preservation Act (NHPA). Under Section 106 of the NHPA, Federal agencies must take into account the potential effect of an undertaking on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Archaeological, architectural, and Native American resources are also protected by a variety of other laws and their implementing regulations: the Archaeological and Historic Preservation Act of 1974, the Archaeological Resources Protection Act of 1979, the American Indian Religious Freedom Act of 1978, and the Native American Graves Protection and Repatriation Act of 1990.

3.6.2 Description of Affected Environment

3.6.2.1 Fairchild AFB

To identify cultural resources that could be potentially affected by the Proposed Action, the area within which archaeological, architectural, and Native American resources would have the potential to be affected must be determined. As defined by 36 CFR 800.16(d) of Section 106 of the NHPA, the area of potential effect represents the “...geographic area or areas within which an undertaking could cause changes in the character or use of historic properties, if any such exists.”

The 2005 Fairchild AFB *Integrated Cultural Resources Management Plan* (ICRMP) identified five archaeological sites at the installation (four historic sites and one prehistoric site); however, none of these sites are at or within the vicinity of the proposed project area. According to the 2005 ICRMP, no archaeological sites important to the Spokane or Coeur d’Alene Indian Tribes have been identified at Fairchild AFB. Previous archaeological surveys conducted at Fairchild AFB indicate the installation has a low potential for significant undisturbed archaeological sites or human remains based on its location; the history of land use; and extensive disturbance from construction and maintenance of the runways, taxiways, and related infrastructure. Previous archaeological surveys of the proposed project area indicate that there are no archaeological sites at or within the vicinity of the proposed project area (FAFB 2005a).

According to a Cultural Resources Survey (CRS) conducted in 2008, the runway, buildings, and structures (i.e., hangars) in the airfield were constructed and used during World War II through the Cold War-era. They represent many diverse functional types for aircraft such as the B-36 and B-52. Results of the 2008 CRS are currently under review by Fairchild AFB and the Washington State Department of Archaeology and Historic Preservation (Washington State Historic Preservation Officer) (FAFB 2008j).

3.6.3 Environmental Consequences

Potential impacts were assessed by (1) identifying the nature and potential importance of cultural resources in potentially affected areas, and (2) identifying activities that could directly or indirectly affect cultural resources classified as historic properties. Cultural resources not yet evaluated are afforded the same regulatory consideration as resources that have been determined eligible or nominated to the NRHP.

3.6.3.1 Proposed Action

3.6.3.1.1 *Repairing Runway 05/23 and Replacing Airfield Lighting Systems*

No impacts on archaeological resources would be expected. Fairchild AFB has a low potential for archaeological resources and there are no known archaeological resources at or within the vicinity of the proposed project area.

No impacts on architectural resources would be expected. There are no known architectural resources at or within the vicinity of the proposed project area. In addition, the repair of Runway 05/23 and replacement of associated airfield lighting systems and their continued same use would not cause any change to buildings, structures, or other cultural resources that might be evaluated and considered eligible for inclusion in the NRHP in the future.

If any unknown archaeological resources or human remains are uncovered during construction, construction activities would cease and a qualified archaeologist would be consulted as per the standard operating procedures outlines in the ICRMP. Work would not resume until an archaeological investigation and appropriate consultations with the Washington State Historic Preservation Officer (SHPO) are completed.

3.6.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23 or replace associated airfield lighting systems. There would be no ground disturbing activity that would potentially affect any known or unknown archaeological resources; therefore, no impacts on cultural resources would be expected.

3.7 Utilities and Infrastructure

3.7.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function and includes utility lines. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. Utilities and infrastructure generally includes water supply, sanitary sewer and wastewater systems, storm drainage, power supply, natural gas supply, solid waste. On USAF installations, infrastructure also includes airfield pavements and airfield lighting systems.

3.7.2 Description of Affected Environment

3.7.2.1 Fairchild AFB

Water Supply. Fairchild AFB receives water from three wells at the Fort George Wright Annex. Water is piped to storage tanks at Fairchild AFB. Bioenvironmental Engineering Flight (92 Aerospace Medicine Squadron) monitors drinking water quality weekly at various points throughout Fairchild AFB, ensuring it meets Federal and state health standards (FAFB 2006a).

The water supply and distribution system consists of the installation-owned potable transmission piping, booster pump stations, and water distribution system piping (FAFB 2007c). In May 2007, headquarters (HQ) AMC Infrastructure Assessment Team rated the water supply and distribution system at Fairchild AFB as “degraded” due to the absence of a Cross-Connection Survey. The Cross-Connection Survey was completed in November 2007; therefore, the water supply and distribution system is currently rated as “adequate” (FAFB 2009d).

Sanitary Sewer and Wastewater System. The sanitary sewer system at Fairchild AFB is composed of the lateral lines from structures, lift stations, 628 sewer manholes, and 243,963 linear feet of sewer collection mains. The sewer flow meters are owned and maintained by the City of Spokane’s Wastewater Department, which treats all of the wastewater from Fairchild AFB. Most of the installation sanitary sewer system is approximately 50 years old. The collection pipe joints and manhole connections have disintegrated with time, causing a groundwater infiltration problem. During periods of known high groundwater, water flow to the City of Spokane’s treatment plant increases by 200 gallons per day (FAFB 2007c). However, recent series of projects have upgraded the sanitary sewer system, reducing historical levels of inflow and infiltration by 80 percent (FAFB 2009d).

Wastewater at Fairchild AFB flows through a gravity collection system and several pumping stations to the Spokane Regional Wastewater Treatment Facility west of the City of Spokane, where it is processed. A private contractor inspects and maintains sanitary sewer pretreatment units on the installation (i.e., oil/water separators [OWSs] and grit traps). The Civil Engineering Water Shop inspects, maintains, and coordinates cleaning or repairs of grease traps and recycle wash racks. There are three mounded drainfield systems on the southern portion of Fairchild AFB (FAFB 2009d).

Storm Drainage System. The storm drainage system at Fairchild AFB consists of storm water collection catch basins, drywells, collection piping, lagoons, drainage ditches, and other storm water conveyances. Fairchild AFB implements BMPs to limit contaminants in storm water runoff. Periodic samples are collected to verify compliance with the installation’s NPDES Storm Water Multi-Sector General Permit (Permit Number: WAR05A025) and *Storm Water Pollution Prevention Plan* (FAFB 2009d). There are six storm drainage pipes that cross under the runway. In 1999, a review of the Fairchild AFB *Sampling, Analysis, and Monitoring Plan for Storm Water and Wastewater* was conducted and no deficiencies in the capacities of the pipes were identified (FAFB 2009b). **Figure 3-2** shows the locations of the six storm water pipes at the runway.

Electrical System. Fairchild AFB purchases power from AVISTA Utilities. Electrical power is fed to two on-installation substations (North Substation and South Substation) at 115 kilovolts (kV). The two substations have three feeder circuits each, distributing power at 13.2 kV. The electrical system consists of the two 13.2 kV substations, power lines (both underground and overhead), high voltage switches, junction boxes, and transformers. The Bonneville Power Administration conducts annual scheduled maintenance on the North and South Substations. Recent studies have shown that the highest demand load is approximately 240 kilowatts (kW) (FAFB 2007c). In July 2005, an Electrical Distribution System

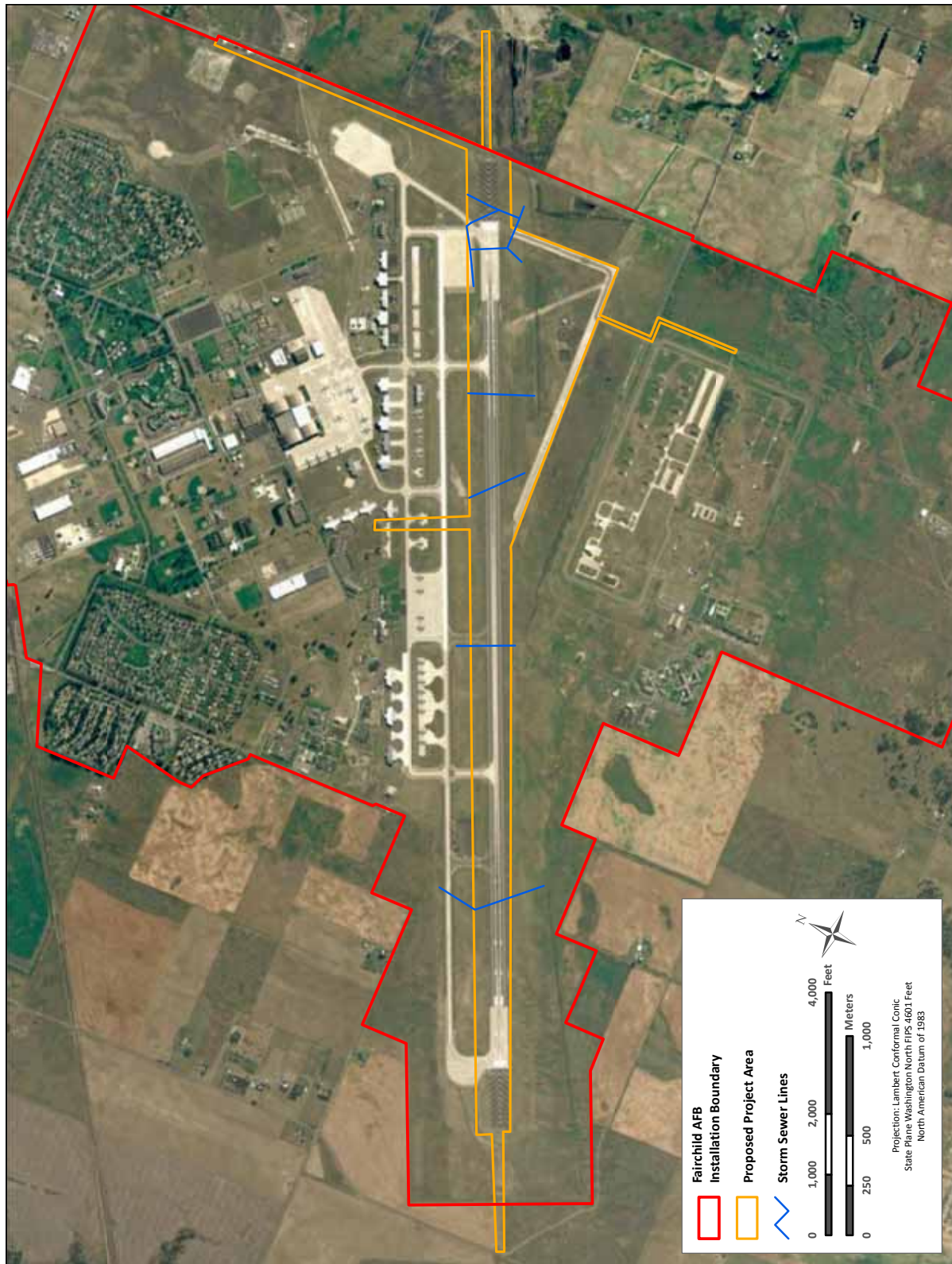


Figure 3-2. Locations of Storm Water Pipes at Runway 05/23

Engineering Study was performed at Fairchild AFB. Results from the study indicated that primary electrical system at Fairchild AFB is operating within limits and has relatively few problems. In addition, the study did not identify any significant issues (FAFB 2009d).

In addition to primary power, Fairchild AFB has backup power systems to support priority facilities (FAFB 2007c). Fairchild AFB operates and maintains 55 Real Property-Installed Equipment and six Equipment Authorization Inventory Data (EAID) generator sets. EIAD generators are equipped with prefabricated cable and cannon plugs to expedite emergency support. Current facility loads meet the 25 percent full rate load requirement in AFI 32-1063, *Electric Power Systems*. All facilities are equipped with maintenance bypass switches to enhance system operation and maintenance capability (FAFB 2009d).

The airfield lighting vault (Building 2014) and associated duct system at the proposed project site currently supply power to the airfield lighting systems. The power distribution system in Building 2014 is served by a 480/277-volt, 3-phase, 800-ampere service. There are 21 Constant Current Regulators (CCRs) (10 kW to 50 kW) and there is one stand-by generator with a capacity of 565 kW housed within Building 2014. The existing airfield duct system contains 15 kV and 5 kV electric lines and extends from the northeastern side of Building 2014, across Taxiway J and Taxiway P, to Runway 05/23 (FAFB 2009b).

Natural Gas System. The natural gas system at Fairchild AFB is owned and operated by AVISTA Utilities. It consists of natural gas lines, valves, vents, and meters. The natural gas system has been expanded to accommodate the decentralization of the installation's heat plant system, which is owned in part by both the USAF and AVISTA Utilities. The government-owned natural gas lines are a mixture of polyethylene and steel piping. AVISTA Utilities performs all polyethylene pipe repairs including repairs to the government-owned lines. The steel gas lines are protected from corrosion by a cathodic protection system (FAFB 2007c).

Solid Waste. Municipal solid waste at Fairchild AFB is managed in accordance with the guidelines specified in AFI 32-7042, *Solid and Hazardous Waste Compliance*. AFI 32-7042 incorporates the requirements of Subtitle D, 40 CFR Parts 240 through 244, 257, and 258; applicable Federal regulations; AFIs; and DOD Directives. It also establishes the requirement for installations to have a solid waste management program that incorporates a solid waste management plan; procedures for handling, storage, collection, and disposal of solid waste; record-keeping and reporting; and pollution prevention. Fairchild AFB has a contract with Waste Management of Spokane for solid waste pick-up and disposal of all refuse on the installation. The contractor removes refuse from the installation and transports it to either the Spokane Regional Waste to Energy Facility or the Graham Road Landfill in Medicine Lake, Washington. Waste is collected in dumpsters located throughout the installation. Currently, there are no operating landfills at Fairchild AFB (FAFB 2007c).

C&D wastes generated from projects that are performed at Fairchild AFB by off-installation contractors are the responsibility of the contractor. Contractors are required to comply with Federal, state, local, and USAF regulations for the collection and disposal of solid waste from the installation. Most C&D waste can be recycled or reused. All nonrecyclable C&D waste is collected in dumpsters until disposed off-site (FAFB 2007c).

Fairchild AFB operates a solid waste recycling program with a full-service recycling center (Building 2420) that accepts a wide variety of materials including household hazardous waste. Building 2420 also has a household hazardous material exchange shelf where personnel can pick up or drop off usable household materials such as paint, cleansers, automotive products, and household chemicals (FAFB 2009d).

Airfield Pavements. Airfield pavements at Fairchild AFB consist of one Category I runway (Runway 05/23), runway overruns, aircraft taxiways, aircraft parking aprons, and shoulders. Ancillary access roads that lead to and from the flightline are also considered airfield pavements. The primary airfield pavement is high-strength concrete with high Allowable Gross Loads for KC-135 and B-52 aircraft, and is able to handle any aircraft in the USAF inventory. The weighted average Pavement Condition Index of the primary 13.4 million square feet of load bearing airfield pavement on Fairchild AFB is 76 (FAFB 2009d). As described in **Section 1.1**, two recent Pavement Condition Index surveys on the PCC slabs reported that most airfield pavements at Fairchild AFB are in adequate condition; however, portions of the runway are declining to “critical” levels. The surveys also reported the following: the 47-year-old PCC pavement has reached the end of its useful life and must be replaced in order to avoid having operations on the runway cause FOD to aircraft; portions of existing airfield pavements are cracking, spalling, and scaling due to age; portions of airfield pavement joint seals are damaged; and corner breaks and linear cracks are beginning to appear at the main departure end of Runway 23 (FAFB 2008a). Throughout the length of the runway, nearly every slab on the keel section has one or more patches, with nearly all of the patches located on the transverse and centerline joints. In addition, some airfield pavements contain ASR caused by the type of aggregate used during the initial construction of the runway in 1956.

Airfield Lighting Systems. Airfield lighting systems at Fairchild AFB include approach lights, threshold lights, runway lights, distance remaining markers, taxiway lights, strobe lights, a PAPI system, a supporting computer system, and cabling. Fairchild AFB has an Approach Lighting System with Sequence Flashing Lights (ALSF-1), centerline, and touchdown zone lights at both ends of Runway 05/23. The ALSF-1 is a high intensity approach light system with sequenced flashing lights used for runway alignment. All of the airfield electrical systems including PAPI, airfield lighting vault, distance markers, and signage have been replaced or upgraded in recent years. However, many light systems are incorrectly located and are out of compliance with AFIs as described in **Section 1.1** (FAFB 2009d). The airfield lighting vault that provides power to the lighting systems is described in the Electrical System paragraph above.

3.7.3 Environmental Consequences

The analysis to determine potential impacts on infrastructure and infrastructure systems considers primarily whether a proposed action would exceed capacity of place unreasonable demand on a specific utility.

Adverse impacts from the Proposed Action on infrastructure and utility resources would range from negligible to minor, compared to the existing demand. Sustainable design measures would be incorporated where practicable to reduce demand. In addition, beneficial impacts would be expected. The construction contractor would coordinate with the Civil Engineering staff at Fairchild AFB and local utility companies prior to commencement of any construction or demolition activities to determine the utility locations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that could be encountered during excavation and trenching activities. Any permits required for excavation and trenching would be obtained prior to the commencement of construction or demolition activities.

3.7.3.1 Proposed Action

3.7.3.1.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

Water Supply. Short-term, negligible, adverse impacts on water supply would be expected. Water demand would increase slightly during the C&D phases of the Proposed Action; however, potential increases in water demand associated with C&D activities would be temporary and are not anticipated to

exceed existing capacity. Therefore, no long-term, adverse, direct or indirect impacts on water supply would be expected.

Sanitary Sewer and Wastewater System. Short-term, negligible, adverse impacts on sanitary sewer and wastewater systems would be expected. There would be a slight increase in wastewater due to C&D activities associated with the Proposed Action. Potential increases in wastewater associated with C&D activities would be temporary and are not anticipated to exceed existing capacity. No long-term, adverse, direct or indirect impacts on sanitary sewer and wastewater systems would be expected.

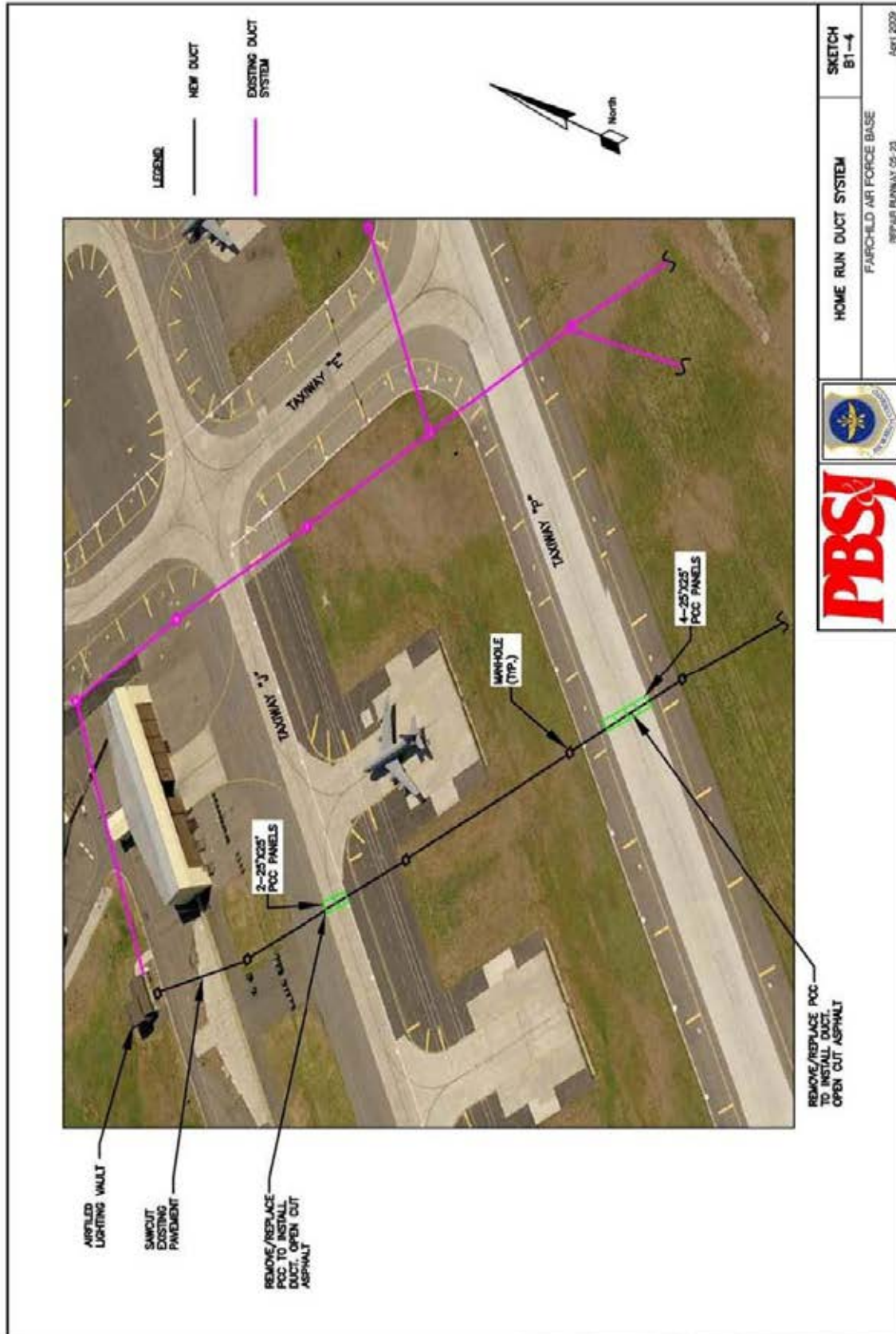
Storm Drainage System. Short-term, negligible to minor, adverse, and long-term, beneficial impacts on storm drainage systems would be expected. Ground disturbance from C&D activities would temporarily increase the potential for soil erosion and sediment transport during sheet flow runoff. As part of the Proposed Action, the overall width of Runway 05/23 would be reduced from 300 feet to 150 feet resulting in long-term beneficial impacts on storm drainage systems. The amount of impervious surfaces would decrease and storm water permeation into the ground would increase, thereby permanently decreasing sheet flow runoff into the storm water drainage system. Because there are no known deficiencies in the capacities of the six storm water pipes within the runway corridor, each of the six pipes would be replaced with new pipes of the same size. Each pipe would be replaced along its entire length from the existing drainage structure at the upstream end of the pipe to the existing drainage structure at the downstream end of the pipe (see **Figure 3-2**) (FAFB 2009b), resulting in a more adequate, structurally sound storm drainage system. No long-term, adverse, direct or indirect impacts on storm drainage systems from would be expected.

Electrical System. Short-term, minor, adverse, and long-term, beneficial impacts on electrical systems would be expected. During C&D there would be two temporary batch plants (one asphalt and one rock crusher) staged on Taxiway K of the proposed project site. Transmission lines would be permanently installed at the proposed project site to supply power to the batch plants during C&D activities: 1,550 linear feet of overhead transmission lines along Thorpe Road and 3,100 linear feet of underground transmission lines to Taxiway K. Any potential increase in electricity demand during the Proposed Action would be temporary and is not anticipated to exceed existing capacity. No long-term, adverse, direct or indirect impacts would be expected.

As part of the Proposed Action, Building 2014 would be expanded to accommodate the new airfield lighting systems, existing CCRs within Building 2014 would be replaced with new CCRs, 5 kV electric lines would be removed from the existing electrical duct system, and a new 5 kV duct system would be permanently installed. The 15 kV electric lines would be left in place in the existing duct system. Upon completion of the Proposed Action, the CCRs would meet the requirements of UFC 3-636-01, previous CCR deficiencies would be corrected, and all of the new and existing airfield lighting circuits would be connected to the new 5 kV duct system, resulting in long-term, beneficial impacts on electrical systems. The proposed new duct system would extend from Building 2014, across Taxiway J and Taxiway P, to Runway 05/23. **Figure 3-3** shows the locations of the existing and proposed new duct systems at Fairchild AFB.

Natural Gas System. No impacts on natural gas systems would be expected. Construction and operational activities associated with the Proposed Action would not require the use of natural gas.

Solid Waste. Short-term, minor, adverse impacts on solid waste disposal would be expected as a result of the Proposed Action. Any increases in municipal solid wastes associated with the C&D phases of the Proposed Action would be minimal, temporary in nature, and would be disposed of in accordance with relevant Federal, state, and local regulations. C&D materials would be recycled or reused to the greatest extent possible. C&D debris that cannot be recycled or reused would be taken off-installation to an



Source: FAFB 2009c

Figure 3-3. Locations of Existing and Proposed New Duct Systems

approved C&D landfill within the vicinity of Fairchild AFB. The closest approved C&D landfill is the Graham Road Landfill, approximately 0.5 miles from Fairchild AFB. The Graham Road Landfill currently has 94 years of capacity remaining on its lifecycle and has adequate capacity to handle C&D waste from the Proposed Action (e²M 2009b).

Airfield Pavements. Long-term, beneficial impacts on airfield pavements would be expected. As part of the Proposed Action, Runway 05/23 would be replaced so that it meets the requirements for medium-strength runway pavements and complies with UFCs 3-260-01 and 3-260-02. Upon completion of the Proposed Action, the risk of FOD to aircraft from operations on the runway would be decreased and previous patches, cracking, spalling, scaling, corner breaks, linear cracks, and ASR on the runway pavement would be eliminated. During C&D activities, the runway would be closed; therefore, no adverse impacts on airfield pavements would be expected.

Airfield Lighting Systems. Long-term, beneficial impacts on airfield lighting systems would be expected. As part of the Proposed Action, airfield lighting systems at Fairchild AFB would be relocated and upgraded where necessary to meet compliance with UFC 3-535-01. The western side of Building 2014 (with the exception of the underground basement) would be expanded southwest by approximately 20 feet in order to accommodate the new airfield lighting systems. The proposed new duct system would extend from Building 2014, across Taxiway J and Taxiway P, to Runway 05/23 (see **Figure 3-3**). During C&D activities, the runway would be closed and the associated airfield lighting systems would be non-operational; therefore, no adverse impacts on airfield lighting systems would be expected.

3.7.3.2 No Action Alternative

Under the No Action Alternative, long-term, minor to moderate, adverse impacts on airfield pavements and airfield lighting systems from continuing operations would be expected. The USAF would not repair Runway 05/23 or replace associated airfield lighting systems. Airfield runway and shoulder pavements would continue to degrade and would remain noncompliant with UFC 3-260-01 and UFC 3-260-02. Airfield pavements considered to be in “critical” condition would not be replaced and would continue to degrade. The USAF would continue to repair cracks and deteriorating areas by patching; however, Runway 05/23 would eventually reach the end of its useful life, which would hinder essential Fairchild AFB mission activities and increase FOD hazards to aircraft. Airfield lighting systems would still be incorrectly located and would remain noncompliant with UFC 3-535-01. No short- or long-term impacts on water supply, sanitary sewer and wastewater systems, storm drainage, power supply, natural gas supply, and solid waste would be expected.

3.8 Transportation

3.8.1 Definition of the Resource

The transportation resource is defined as the system of roadways and highways that are in the vicinity of the proposed project site and could be potentially impacted by the Proposed Action. The resource also includes parking, access to installation, and vehicular movement within the installation. Transportation represents the movement of humans and commodities from one place to another. It is directly related to areas of production and habitation and to the system of vehicle access roads and alternative forms of travel including ground, rail, and air. Primary roadways (e.g., major interstates) are principal routes designed to move traffic efficiently to adjacent areas. Secondary roadways or arterials (e.g., major surface streets) are designed to provide access to residential, commercial, and parking areas and access points for the installation.

3.8.2 Description of Affected Environment

3.8.2.1 Fairchild AFB

Fairchild AFB is approximately 12 miles west of Spokane, Washington. The primary access point to Fairchild AFB is U.S. Route 2, an east-west directional roadway north of the installation. There are two major roadways south of the installation: Interstate Highway (I)-90, an east-west directional roadway that provides access out of the City of Spokane; and State Route 902, which provides access from I-90 to the Medical Lake area. Brooks Road is a north-south directional roadway west of the installation and various smaller arterial roads are east of the installation.

The main gate into Fairchild AFB is off U.S. Route 2, along the northern perimeter of the installation. The main gate is accessed from a traffic light and two left turn lanes. During times of heightened security, traffic at the main gate can be backed up in the two left turn lanes. The commercial gate, reserved for commercial vehicles entering Fairchild AFB, is off Rambo Road, along the northeastern perimeter of the installation. Parking facilities at Fairchild AFB currently meet the needs for the installation. Mitchell Drive and Fairchild Highway are the two main roadways within Fairchild AFB, acting as main arteries for traffic in and out of the installation (FAFB 2009d).

A traffic circulation study was conducted in August 2008 for Fairchild AFB. Results from the traffic study indicate that during peak morning traffic (6:30 to 8:30 a.m.), 1,025 vehicles enter and 144 vehicles exit the installation through the main gate. During peak mid-day traffic (11:00 a.m. to 1:00 p.m.), 359 vehicles enter and 369 vehicles exit the installation through the main gate. During the evening (3:00 to 5:00 p.m.), 303 vehicles enter and 1,136 vehicles exit the installation through the main gate. The study concluded that existing roadways perform adequately (FAFB 2008d).

3.8.3 Environmental Consequences

Impacts on transportation are considered to be adverse if the Proposed Action would result in a substantial increase in traffic, which is defined as more than 50 trips per hour, on local roadways. Project trip generation is based on an estimate of the number of equipment and crew members that would be present during construction activities.

3.8.3.1 Proposed Action

3.8.3.1.1 *Repairing Runway 05/23 and Replacing Airfield Lighting Systems*

Short-term, negligible to minor, adverse impacts on transportation would be expected. Approximately 175,750 CY of construction materials would be imported on-installation and approximately 23,100 CY of demolition materials would be exported off-installation, resulting in a total of approximately 30,000 vehicle trips (e²M 2009a). The haul route for construction vehicles travelling on-installation would be from U.S. Route 2, to Rambo Road, thru the commercial gate, to an unimproved access road (parallel to Rambo Road), to the proposed project site and vice versa for construction vehicles travelling off-installation. The contractor would use existing on-site C&D materials for as needed repairs to the unimproved access road; therefore there would be no impacts on installation roads. Potential increases in regional traffic volume in the vicinity of Fairchild AFB due to construction vehicles associated with the Proposed Action would be temporary. A temporary staging area for construction machinery (i.e., batch plants) and a temporary parking lot for construction vehicles would be used during the Proposed Action; therefore, there would be no impacts on parking at the installation (see **Figure 1-2**). Appropriate signage would be in place for C&D traffic. No long-term, adverse, direct or indirect impacts on transportation would be expected.

3.8.3.2 No Action Alternative

Under the No Action Alternative, Fairchild AFB would not repair Runway 05/23 or replace associated airfield lighting systems. Current transportation situations would prevail and no impacts on or changes to transportation would be expected.

3.9 Hazardous Materials and Wastes

3.9.1 Definition of the Resource

A hazardous substance, pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. §9601(14)), is defined as: “(A) any substance designated pursuant to section 1321(b)(2)(A) of Title 33; (B) any element, compound, mixture, solution, or substance designated pursuant to section 9602 of this title; (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, (42 U.S.C. §6921); (D) any toxic pollutant listed under section 1317(a) of Title 33; (E) any HAP listed under section 112 of the CAA (42 U.S.C. §7412); and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator of the USEPA has taken action pursuant to section 2606 of Title 15. The term does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).”

Hazardous materials are defined by 49 CFR 171.8 as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions” in 49 CFR Part 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

RCRA defines a hazardous waste in 42 U.S.C. §6903, as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.”

3.9.2 Description of Affected Environment

3.9.2.1 Fairchild AFB

Hazardous Materials and Wastes. AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards governing procurement, issuance, use or disposal of hazardous materials and tracking and recording keeping for public safety and for compliance with all laws and regulations. Fairchild AFB monitors environmental permits, storage, spill prevention, and response. AFI 32-7042, *Solid and Hazardous Waste Compliance*, directs roles and responsibilities with waste stream management including planning, training, emergency response, and pollution prevention. Hazardous wastes generated at Fairchild AFB include flammable solvents, contaminated solids, stripping chemicals, used oils, waste paint-related materials, and other miscellaneous items (FAFB 2007a).

Hazardous and toxic material procurements on Fairchild AFB are approved and tracked by appropriate members of the hazardous materials team. Installation supply personnel receive, inspect, distribute, and track hazardous materials. A “pharmacy” system for the distribution of hazardous materials was

implemented at Fairchild AFB in 1996. The purpose of the pharmacy system is to minimize and control the use of hazardous materials in order to minimize the generation of hazardous wastes. In addition, current inventories of hazardous materials are assessed to determine if less-toxic alternatives exist. Bench stock quantities of materials are distributed to authorized recipients on an as needed basis (FAFB 2007a).

Runway and taxiway joint sealants are known to contain high concentrations of polycyclic aromatic hydrocarbons (PAH). On July 2, 2008, a visual inspection and representative sampling of the airfield was conducted. Results from the inspection revealed that the total listed PAH present in the airfield was determined to be greater than 1 percent, potentially triggering a dangerous waste designation. However, according to WAC 173-303-071 (3)(e), *Excluded Categories of Waste*, the following category of waste is excluded from the requirements of Chapter 173-303 WAC, *Dangerous Waste Regulations*: “asphaltic materials designated only for the presence of PAHs by WAC 173-303-100(6). For the purposes of this exclusion, asphaltic materials means materials that have been used for structural and construction purposes (e.g., roads, dikes, paving) that were produced from mixtures of oil and sand, gravel, ash, or similar substances” (WAC 2009). A Material Safety Data Sheet (MSDS) obtained from 92 CES/CEOH for the joint filler used for in-house work on the airfield detailed a 45 to 55 percent petroleum asphalt base and 13 to 20 percent clay/mineral filler along with some water and synthetic rubber. Thus, it was determined that joint sealant is petroleum-based (oil) mixed with a mineral filler and the exclusion is applicable (FAFB 2008b).

The 92nd ARW maintains a Hazardous Waste Management Plan as directed by AFI 32-7042, Solid and Hazardous Waste Compliance. This plan prescribes the roles and responsibilities of all members of Fairchild AFB with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The plan establishes the procedures to comply with applicable Federal, state, and local standards for solid waste and hazardous waste management (FAFB 2007c). Fairchild AFB generates more than 1,000 kilograms of hazardous waste in 1 calendar month and therefore, is considered to be a large quantity generator of hazardous wastes, as defined by 40 CFR 262.34 (FAFB 2009d). Hazardous wastes generated at Fairchild AFB include flammable solvents, contaminated fuels and lubricants, paint/coating, stripping chemicals, waste oils, waste paint-related materials, municipal solid waste, and other miscellaneous wastes as a result of various industrial processes on the installation (FAFB 2007c). Hazardous wastes at Fairchild AFB are managed according to the “cradle-to-grave” approach established by RCRA. Under this approach, a privately contracted hazardous materials pharmacy tracks materials containing hazardous components as they move to and from the end user (FAFB 2009d).

Fairchild AFB operates one 90-day accumulation site and 18 satellite accumulation points (SAPs). A SAP is an area at or near the point of waste generation where the user accumulates small quantities of “total regulated hazardous waste” up to 55 gallons or up to 1 quart of “acutely hazardous waste.” When volume exceeds these limits, the user must place the volume in excess of the limit in another container and transfer the full container to a 90-day accumulation site within 72 hours for a maximum of 90 days. A 90-day accumulation site is a designated area at or near the workplace where hazardous waste accumulates before being transported off-installation for ultimate disposal. A contracted hazardous waste transporter picks up the hazardous waste containers from the 90-day accumulation site and transports them to an off-installation licensed Treatment, Storage, and Disposal Facility (FAFB 2009d).

Asbestos-Containing Materials. AFI 32-1052, *Facilities Asbestos Management*, provides the direction for asbestos management at USAF installations. This instruction incorporates by reference applicable requirements of 29 CFR Part 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.3.80, Section 112 of the CAA, and other applicable AFIs and DOD Directives. AFI 32-1052 requires installations to develop an asbestos management plan for the purpose of maintaining a permanent record of the status and condition of asbestos-containing material (ACM) in installation facilities, as well as documenting

asbestos management efforts. In addition, the instruction requires installations to develop an asbestos operating plan detailing how the installation accomplishes asbestos-related projects. Asbestos is regulated by USEPA with the authority promulgated under OSHA, 29 U.S.C. 669 et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. Building materials in older buildings are assumed to contain asbestos. It exists in a variety of forms and can be found in floor tiles, floor tile mastic, roofing materials, joint compound used between two pieces of wallboard, some wallboard thermal system insulation, and boiler gaskets. USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat (FAFB 2007c). Asbestos at Fairchild AFB is managed in accordance with the *Asbestos Management Plan* that is updated annually. This plan specifies procedures for the removal, encapsulation, enclosure, and repair activities associated with ACM-abatement projects. In addition, it is designed to protect personnel who live and work on Fairchild AFB from exposure to airborne asbestos fibers, as well as to ensure the installation remains in compliance with Federal, state, and local regulations pertaining to asbestos (FAFB 2008f).

In 2003, a Limited Asbestos Survey was conducted of the walls and building materials in Buildings 1105A, 1101, 1204, and 2014. Suspect ACMs were collected and sampled to determine the type and percentage of asbestos in the materials. Results from the survey indicate that cement asbestos board shingles found on the exterior walls of Buildings 1101 and 1105A contained between 15 and 25 percent chrysotile asbestos. The remaining samples collected were found to be non-ACMs (FAFB 2003b).

Lead-Based Paint. USAF policy and guidance establishes lead-based paint (LBP) management at USAF facilities. The policy incorporates by reference the requirements of 29 CFR 1910.120, 29 CFR Part 1926, 40 CFR 50.12, 40 CFR Parts 240 through 280, the CAA, and other applicable Federal regulations. In addition, the policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating LBP hazards. The Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X), passed by Congress on October 28, 1992, regulates the use and disposal of LBP on Federal facilities. Federal agencies are required to comply with applicable Federal, state, and local laws relating to LBP activities and hazards (FAFB 2007c).

LBP at Fairchild AFB is managed in accordance with the installation's *Lead Exposure and Lead-Based Paint Management Plan* and is updated annually. The plan is designed to establish management responsibilities and procedures for identifying and controlling hazards related to the presence of LBP. The plan addresses organizational roles and responsibilities, program development, management actions, data management, and training (FAFB 2008g).

In 2003, a Limited LBP Inspection was conducted at Fairchild AFB of the walls and building components in Buildings 1101, 1105A, 1150, 1204, 2014, and 2159. Results from the inspection indicate that X-ray Fluorescence assays of the paint associated with all components tested in Buildings 1105A, 1150, 1204, 2014, and 2159 did not produce results above the USEPA action level of 1.0 milligrams/centimeters². However, paint associated interior and exterior components used in the construction of Building 1101 should be considered lead-containing (FAFB 2003a).

Radon. Fairchild AFB and Spokane County are in Federal USEPA Radon Zone 1, or the highest priority zone (average indoor level > 4 picoCuries per liter [pCi/L]) (FAFB 2006a).

Pesticides. Fairchild AFB's *Pest Management Plan* is based on AFI 32-1053, *Pest Management Program*, and DOD Directive 4150.7, *DOD Pest Management Program*. The plan follows the guidance recommended by the Armed Forces Pest Management Board (AFPMB) as written in Technical Information Memorandum (TIM) 18 and DOD 4150.7, Enclosure 8. TIM 18 provides information, guidance, and uniformity of pest management programs. It reflects the functional elements of an

effective program as recognized by the AFPMB. Fairchild AFB is required to maintain an annual pest management plan. An effective pest control program enhances the quality of life for installation personnel and minimizes pesticide exposure to the environment. This is achieved through aggressive integrated pest management programs, education, and the support and cooperation of all installation personnel and local agencies. The *Pest Management Plan* presents a variety of pest-control techniques aimed at controlling pests while limiting the quantity of pesticides used at the installation (FAFB 2007b). Fairchild AFB also developed an *Integrated Pest Management Plan* that describes the proper management of noxious weeds and details the types of herbicides, biological controls, and other management practices to be used in the control of noxious weeds (FAFB 2005b). The primary goal of the pest management program is to protect the health and morale of all residents and employees of Fairchild AFB. In addition, actions are taken to protect property, ensure safety and security requirements are met, and to reduce labor requirements for other shops (FAFB 2007b).

There are no restricted-use pesticides or herbicides used at Fairchild AFB. Pesticide and herbicide applications are currently being implemented on a contractual basis and there are no pesticide or herbicide storage locations at Fairchild AFB.

Aboveground and Underground Storage Tanks. There are 12 aboveground storage tanks (ASTs) with capacities of more than 10,000 gallons at Fairchild AFB, primarily at the bulk fuel storage facility between Vet Road and Petroleum, Oils, and Lubricants (POL) Road. All of the ASTs are in compliance with Federal and state regulations (FAFB 2009d).

Fairchild AFB manages a regulated tank inventory of 23 underground storage tanks (USTs). All of these USTs meet regulatory compliance criteria. There are an additional 32 USTs at Fairchild AFB that are managed by the installation but are deferred or exempt from regulatory requirements. The USTs that are exempt from regulatory requirements consist of heating oil storage tanks, emergency spill tanks, and OWS storage tanks. More than 200 inactive USTs have been removed at Fairchild AFB. USTs removed includes those discovered to be leaking, replaced with tanks containing double-walled systems, previously abandoned over the years, replaced with an AST, and various sizes of heating oil tanks that became inactive after the installation of natural gas furnaces. A risk analysis was conducted at former UST sites with known soil contamination, and results from the analysis indicate that the residual contamination remaining was fairly insignificant (FAFB 2009d). There are no known current or former leaking UST sites at or within the vicinity of the proposed project area.

The USAF generally discourages new construction of USTs. Where USTs are necessary, their design and construction must meet Federal Code technical standards. All ASTs must have secondary containment structures and appropriate leak detection systems per AFI 32-7044 (FAFB 2009d). Current operational USTs and ASTs within the vicinity of the proposed project area are summarized in **Tables 3-13** and **3-14**, respectively.

Environmental Restoration Program. The DOD's ERP requires each installation to identify, investigate, and clean up hazardous waste disposal or release sites. The ERP at Fairchild AFB was initiated in 1984 with an installation-wide Preliminary Assessment/Records Search that identified 15 ERP sites for further investigation. In 1989, Fairchild AFB was placed on the USEPA's National Priorities List, which is a list of sites that are considered to be of special interest and require immediate attention. Supplemental site assessments and investigations in the later 1980s and 1990s at Fairchild AFB brought the total number of ERP sites to 37. Currently, 21 ERP sites are closed under No Further Action (NFA) or No Further Remedial Action Planned (NFRAP), 7 are expected to be NFA, nine are under remediation, and an additional 2 (Areas of Concern [AOC]) are under investigation. The ERP sites include spill areas, drainage areas, landfills, storage tanks, fire training areas, and radioactive waste sites.

Table 3-13. Summary of Operational USTs Within the Vicinity of the Proposed Project Area

Facility Number	Shop/Office	Product Stored	Capacity (gals)
159	Pump House C	JP-8	50,000
159	Pump House C	JP-8	50,000
159	Pump House C	JP-8	50,000
159	Pump House C	JP-8	50,000
159	Pump House C	JP-8	50,000
159	Pump House C	JP-8	25,000
2028	Pump House A	JP-8	4,000
2051	Flightline Gas Station	Unleaded Gas	1,000
2051	Flightline Gas Station	JP-8	6,000
2051	Flightline Gas Station	Diesel	8,000
2014	Airfield Lighting	Diesel	6,000

Source: FAFB 2009e

Table 3-14. Summary of Operational ASTs Within the Vicinity of the Proposed Project Area

Facility Number	Shop/Office	Product Stored	Capacity (gals)
2035	Pump House A	Diesel	150
2037	Pump House A	JP-8	420,000
2038	Pump House A	JP-8	420,000

Source: FAFB 2009e

Primary contaminants in soil and groundwater include waste solvents, fuels, dissolved phase fuels and solvents, and low-level radioactive waste. Seventeen ERP sites have associated institutional or land use controls (FAFB 2006a). Because of the location of ERP sites and remedial actions underway, controls may restrict or limit the use of property and limit access to prevent exposure to contaminants that pose an unacceptable risk to human health and the environment. Any projects involving ground disturbance at ERP sites requires coordination prior to commencement of project activities (FAFB 2009d). **Table 3-15** presents a summary of the ERP sites and AOCs within 0.5 miles of the proposed project site at Fairchild AFB including the site ID, description, and status. **Figure 3-4** shows the location of ERP sites and AOCs at Fairchild AFB. ERP sites that are discussed in further detail below are either at, immediately adjacent to, or in the vicinity of the proposed project site.

SD-38. ERP site SD-38 is within the vicinity of Taxiway K at the proposed project site and currently has a NFRAP status. The site consists of a system of ditches, pipes, and culverts that were used to connect the OWS to eight drainage subbasins to convey all storm water runoff and process wastewater at Fairchild AFB. Contaminated sediment in the ditches at site SD-38 has been removed (FAFB 2009a).

OT-17. ERP site OT-17 is within the vicinity of Taxiway K at the proposed project site. OT-17 is currently in the Remedial Action-Operation (RA-O) stage and remediation is ongoing. The site consists of a former location for jet engine testing. Operations at the facility resulted in releases of jet fuel that was routinely washed into a dry well. The dry well discharged into a storm water ditch, north of the

facility. As a result, there is groundwater contamination at OT-17 due to releases of jet fuel (FAFB 2009a).

Table 3-15. Summary of ERP Sites and AOCs within 0.5 Miles of the Proposed Project Site

Site ID	Description	Status
LF-01*	Old Base Landfill	RA-O
WP-03*	Industrial Wastewater Lagoons	RA-O
FT-04*	Fire Training Area	RA-O
SD-05	French drain system	NFA
SS-08	Aircraft Crash Site	NFA
RW-11*	Radioactive Waste Disposal Areas	SI/NFA
DP-12	Disposal Area near WANG Test Cell	NFA
DP-14	Disposal Area (East Weapons Storage Area)	NFA
OT-17*	Jet Engine Test Cell	RA-O
SS-18*	Refueling Pit Area	RA-O
DP-24	Asphalt South of Taxiway K	NFA
SS-26*	Underground Fuel Line Area	RA-O
SS-27	Defueling Tank Area	NFA
SD-31	Fuel Truck Maintenance Area	NFA/IC
FT-32*	Fire Training Area	RA-O
SS-33	Waste Storage Area (Building 2115)	SI/IRA
SD-34	Waste Fuel Operations (Building 1012)	SI/IRA
WP-36*	Holding Lagoon and Imhoff Tank	SI/RA-O
SD-38	Ditches, piping, and culverts (installation-wide)	SI/IRA
SS-39*	Trichloroethylene (TCE) Orphan Plumes, installation-wide	RI/FS
AOC-2	Propulsion Shop	SI/NFA

Source: FAFB 2009d

Note: *Institutional or land use controls in place.

Key:

FS = Feasibility Study

IRA = Interim Remedial Action

NFA = No Further Action

RA = Remedial Action

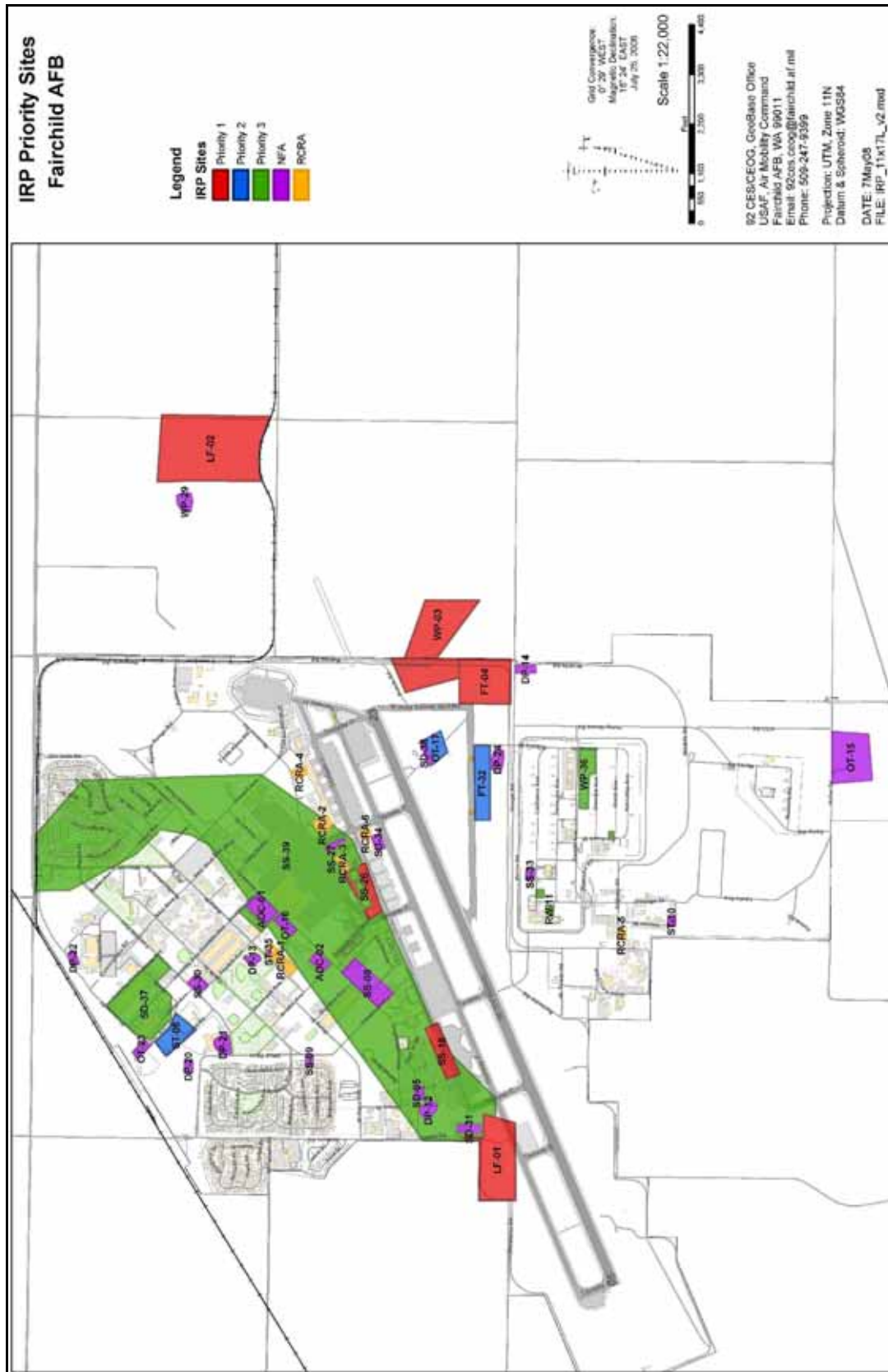
RI = Remedial Investigation

RA-O = Remedial Action-Operation

ROD = Record of Decision

SI = Site Investigation

FT-32. ERP site FT-32 is adjacent to the south of Taxiway K. FT-32 is currently in the RA-O stage and remediation is ongoing. The site was a former fire training area, east of Fairchild AFB. Surface soils at FT-32 are contaminated with petroleum residues, TCE, and metals. Groundwater is contaminated with manganese, fuel residuals, and chlorinated hydrocarbons (FAFB 2009a).



Source: FAFB 2008i

Figure 3-4. Location of ERP Sites and AOCs at Fairchild AFB

DP-24. ERP site DP-24 is adjacent to the proposed project area, south of Taxiway K. Site DP-24 currently has a NFRAP status. The site was a former waste disposal area. DP-24 was determined to be NFA by the State of Washington Department of Ecology in 1993, and by the USEPA in 1994 (FAFB 2009a).

SS-39. ERP site SS-39 is near Building 2014 and north of the runway at the proposed project site. SS-39 consists of TCE orphan plumes in soil and groundwater and is currently in the Record of Decision/Decision Document status. Although the relative risk for exposure to pathways at SS-39 is high, there are currently no completed pathways (FAFB 2009a). The SS-39 contaminant plume extends approximately 2.5 miles from the west side of the installation to the area near the northeastern portion of the installation. The width of the plume extends up to 1,500 feet at some locations; however, it extends 300 to 600 feet at other locations. The depth of the contaminant plume generally follows the shallow alluvial groundwater at 10 to 60 feet below ground surface. Groundwater at SS-29 is not currently used as a drinking water source and it is not known to meet the criteria for exclusion as a potential future drinking water source (FAFB 2008c).

WP-03. ERP site WP-03 is adjacent to the haul route that would be used by construction vehicles for the Proposed Action. WP-03 is currently in the RA-O stage. The site consists of an industrial wastewater lagoon system (i.e., two interconnected, unlined wastewater lagoons, a skimming lagoon, and a holding lagoon) found south of Runway 23 between Rambo Road and the north-south portion of Taxiway H. The lagoons drain into No Name Ditch, which flows perennially off-installation to the southeast. Waste types known to have been discharged into the lagoons in the past include Jet Propellant-4 (JP-4) fuel, oils, industrial solvents, acids, and cleaning compounds. The contaminant of concern is TCE in groundwater and the current remedy is a small groundwater pump and treatment system along with long-term monitoring (FAFB 2009a).

FT-04. ERP site FT-04 is also along the haul route that would be used by construction vehicles. FT-04 is currently in the RA-O stage. The site was a former fire training area in the eastern portion of the installation, south of Runway 23. JP-4, waste oil, and solvents were used at the site. The contaminants of concern for are benzene, toluene, ethylbenzene, and xylenes in soil and benzene in groundwater. The selected remedies include an in situ soil bioventing treatment system, an air sparge system for contaminated groundwater, and soil and groundwater long-term monitoring (FAFB 2009a).

LF-01. ERP site LF-01 is within the vicinity of the proposed project site at the southwestern corner of the installation, near Runway 05. LF-01 was a former landfill that served as the installation's main disposal site from 1949 to 1958. It covers approximately 15 acres and wastes disposed of include industrial wastes, plating sludges, solvents, lubricating oils, cutting oils, shavings, dry-cleaning filters, spent filtrates, paint wastes, ash, and miscellaneous sanitary wastes. LF-01 is currently in the RA-O stage and remediation and ongoing. Presently, there are monitoring wells that monitor groundwater at LF-01 (FAFB 2009a).

3.9.2.2 Grant County IAP

Proposed aircraft operations and maintenance activities at Grant County IAP would take place at existing airfields and maintenance facilities and would not include demolition of structures, new construction, or ground disturbing activities. Therefore, it is not anticipated that asbestos, LBP, pesticides, contaminated soils or groundwater, or radon would be encountered at Grant County IAP as a result of the Proposed Action (e²M 2009e).

Small quantities of hazardous materials including, but not limited to, sheet metal and associated adhesives, solvents, sealants, primers, resins, and enamels; lubricants; filters; oils (e.g., air tool oil and

engine oil); hydraulics; cleaners; and corrosion prevention compounds would be used at Grant County IAP during aircraft operations and maintenance activities (92 AMXS undated). Maintenance equipment used at Grant County IAP would include aircraft support/ground equipment (powered and nonpowered), consolidated tool kits, a fuel spill trailer, and a fuel bowser (e²M 2009d). It is assumed that most of the hazardous materials and maintenance equipment would be shipped from Fairchild AFB to Grant County IAP, as needed. All fuel currently used at Grant County IAP is delivered by truck to Grant County IAP and stored in two “Jet-A” ASTs that have capacities of approximately 2.9 million gallons and 331,000 gallons. Five R-11 Refuelers (mobile refueling vehicles) containing ASTs with capacities of 6,000 gallons would be transported to Grant County IAP as part of the Proposed Action. Fuel used during the Proposed Action would be supplied by the two ASTs at Grant County IAP and purchased through the Defense Energy Support Center (DESC) and the Defense Working Capital Fund (DWCF). The R-11 Refuelers would transport fuel from the ASTs to the aircraft. All fuel supply, storage, and receipt of fuel would be coordinated through the DESC. No additional fuel storage tanks would be required at Grant County IAP for the Proposed Action (e²M 2009f, e²M 2009g). Small quantities of hazardous wastes generated at Grant County IAP during the Proposed Action include, but are not limited to, JP-8 fuel and pads, isopropyl, filters, oil and hydraulic pads, and engine oil (e²M 2009d). Hazardous materials and wastes associated with aircraft operations and maintenance activities at Grant County IAP would be handled and managed according to AFI 32-7086, AFI 32-7042, and the 92nd ARW Hazardous Waste Management Plan (see **Section 3.9.2.1**).

3.9.2.3 Spokane IAP

Proposed aircraft operations and maintenance activities at Spokane IAP would take place at existing airfields and maintenance facilities and would not include demolition of structures, new construction, or ground disturbing activities. Therefore, it is not anticipated that asbestos, LBP, pesticides, contaminated soils or groundwater, or radon would be encountered at Spokane IAP as a result of the Proposed Action (e²M 2009e).

Hazardous materials used, maintenance equipment used, and hazardous wastes generated during aircraft operations and maintenance activities at Spokane IAP would be similar to the hazardous materials used, maintenance equipment used, and hazardous wastes generated at Grant County IAP (see **Section 3.9.2.2**). It is assumed that most of the hazardous materials and maintenance equipment would be shipped from Fairchild AFB to Spokane IAP, as needed. All fuel currently used at Spokane IAP is stored in three ASTs at Spokane IAP that have a combined total capacity of approximately 250,000 gallons. Two R-11 Refuelers containing ASTs with capacities of approximately 6,000 gallons would be transported to Spokane IAP as part of the Proposed Action. Fuel used during the Proposed Action would be supplied by the three ASTs at Spokane IAP and purchased through the DESC and the DWCF. The R-11 Refuelers would transport fuel from the ASTs to the aircraft. All fuel supply, storage, and receipt of fuel would be coordinated through the DESC. No additional fuel storage tanks would be required at Spokane IAP for the Proposed Action (e²M 2009g). Hazardous materials and wastes associated with aircraft operations and maintenance activities at Spokane IAP would be handled and managed according to AFI 32-7086, AFI 32-7042, and the 92nd ARW Hazardous Waste Management Plan (see **Section 3.9.2.1**).

3.9.3 Environmental Consequences

3.9.3.1 Proposed Action

3.9.3.1.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

Short- and long-term, negligible to minor, adverse impacts would be expected from potentially encountering hazardous materials and wastes due to C&D activities. Any hazardous materials

encountered or hazardous waste generated during C&D activities must be handled in accordance with all appropriate environmental laws and regulations.

Hazardous Materials and Wastes. Short-term, minor, adverse impacts would be expected. Construction activities would require the use of certain hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. It is anticipated that the quantity of products containing hazardous materials used during the Proposed Action would be minimal and their use would be of short duration. The quantity of hazardous wastes generated from proposed construction activities would be minor and would not be expected to exceed the capacities of existing hazardous waste disposal facilities. Hazardous materials and wastes would be handled under the existing DOD RCRA-compliant waste management programs and, therefore, would not be expected to increase the risks of exposure to workers and installation personnel. The existing runway and taxiway joint sealants are excluded from the dangerous waste classification by WAC 173-303-071 and would be disposed of at a local landfill within the vicinity of Fairchild AFB during demolition activities. Prior to commencement of C&D activities, the contractor would be required to obtain the necessary permits, which should include the applicable WAC citation regarding this exclusion. No long-term, direct or indirect, adverse impacts would be expected.

Asbestos-Containing Material. Short-term, negligible, adverse impacts would be expected. It is anticipated that the demolition of Building 1101 would generate ACM wastes. Any ACM encountered during building demolition and clean-up would be handled in accordance with established USAF policy and the *Asbestos Management Plan*. USAF regulations prohibit the use of ACM for new construction. Demolition plans would be reviewed by Fairchild AFB civil engineering personnel to ensure appropriate measures were taken to reduce potential exposure to, and release of, asbestos. The USAF would follow its current practices for removal of friable asbestos and other ACM associated with Building 1101. Friable ACM would be removed and disposed of at an asbestos-permitted landfill.

Lead-Based Paint. Short-term, negligible, adverse impacts would be expected. It is anticipated that the demolition of Building 1101 would generate LBP wastes. Any LBP encountered during building demolition and cleanup would be handled in accordance with established USAF policy and the *Lead-Based Paint Management Plan*. Demolition plans would be reviewed by Fairchild AFB civil engineering personnel to ensure appropriate measures were taken to reduce potential exposure to, and release of, lead from LBP. The USAF would follow its current practices for removal of LBP associated with Building 1101. It is anticipated that no LBP would be encountered during the expansion of Building 2014. In addition, USAF regulations prohibit the use of LBP for new construction; therefore no materials containing lead would be used during the expansion of Building 2014.

Radon. Long-term, minor, adverse impacts would be expected. Because the average indoor radon level at Fairchild AFB is generally greater than the USEPA-recommended action level of 4 pCi/L, if radon testing determines such, the expansion of Building 2014 should include an appropriate level of mitigation for radon such as installing radon pumps to exhaust vapors outside or installing passive radon systems to lower radon levels.

Pesticides. No impacts would be expected. There are no restricted use pesticides or herbicides used at Fairchild AFB. All pesticides and herbicides are handled and applied according to Federal, state, and local regulations and the installation's Pest Management Plan and Integrated Pest Management Plan. No pesticides or herbicides are stored at the proposed project site or Fairchild AFB.

Aboveground and Underground Storage Tanks. No impacts would be expected. There are no known open leaking UST cases at or within the vicinity of the proposed project site. If any petroleum-contaminated soil was subsequently discovered during C&D activities, the contractor would be required to immediately stop work, report the discovery to the installation and implement the appropriate safety precautions. Commencement of field activities could not continue in this area until the issue was

investigated. USTs and ASTs within the proposed project area are not anticipated to be impacted by the Proposed Action and would continue to be used with appropriate BMPs in place (e.g., secondary containment, leak detection systems, and alarm systems). Updated site-specific information regarding USTs and ASTs within the proposed project area would be obtained prior to commencement of construction and demolition activities.

Environmental Restoration Program. Short-term, negligible to minor, adverse impacts would be expected. C&D activities are in the vicinity of active ERP sites, including ERP sites SD-38, OT-17, FT-32, DP-24, SS-39, WP-03, FT-04, and LF-01, as discussed above in **Section 3.8.2**. No impacts on or from ERP sites would be expected during C&D activities. If contaminated groundwater or soil from nearby ERP sites is encountered during construction or demolition activities, the handling, storage, transportation, and disposal of hazardous substances would be conducted in accordance with applicable Federal, state, and local regulations; USAF regulations; and Fairchild AFB management procedures. Project planning would include protection of ERP infrastructure such as monitoring wells, treatment systems, and conveyance pipes to avoid disruption of clean-up activities and minimize potential impacts on ERP infrastructure.

3.9.3.1.2 Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure

No impacts from ACM, LBP, radon, pesticides, ERP sites, or storage tanks would be expected. Short-term, negligible to minor, adverse impacts would be expected from the generation and use of hazardous materials and wastes. It is anticipated that the quantity of products containing hazardous materials used during aircraft operations and maintenance activities would be minimal and their use would be of short duration. It is anticipated that the quantity of hazardous waste generated during aircraft operations and maintenance activities would be limited to fuel and equipment maintenance products, and would not be expected to exceed the capacities of existing hazardous waste disposal facilities. Hazardous materials and wastes would be handled under the existing DOD RCRA-compliant waste management programs and, therefore, would not be expected to increase the risks of exposure to installation personnel.

3.9.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23 or replace associated airfield lighting systems. There would be no soil disturbance at the proposed project site and no risk of encountering hazardous substances. No demolition of structures would occur as planned under the Proposed Action. In general, there would be no change in or impacts on environmental restoration, hazardous materials and wastes at Fairchild AFB if the Proposed Action were not implemented.

3.10 Safety

3.10.1 Definition of the Resource

A safe environment is one in which the potential for death, serious bodily injury or illness, or property damage is eliminated or reduced as much as possible. Human health and safety addresses workers' health and safety during burning, demolition, and construction activities, and public safety during burning, demolition, and construction activities and subsequent operations of those facilities.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Activities that can be hazardous include transportation,

maintenance and repair activities, and the creation of extremely noisy environments. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

AFI 91-202, *USAF Mishap Prevention Program*, implements AFD 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the BASH Program), assigns responsibilities for program elements, and contains program management information. This instruction applies to all USAF personnel. AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements AFD 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements. EIA 32 CFR 989.27, *Occupational Safety and Health*, requires an assessment of direct and indirect impacts of proposed actions on the safety and health of USAF employees and others at a work site. This instruction applies to all USAF activities (FAFB 2007c).

3.10.2 Description of Affected Environment

3.10.2.1 Fairchild AFB

All applicable standards, such as those required by the Occupational Safety and Health Administration (OSHA) are strictly followed at Fairchild AFB. Installation personnel are regularly briefed on hazards and safety concerns existing in their particular workplace. All contractors performing construction activities are responsible for following ground safety and OSHA regulations and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and use and availability of MSDSs. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplaces; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures or engaged in hazardous waste work (FAFB 2007c).

There are several areas that are constrained by Explosive Safety Quantity Distance clear zones at Fairchild AFB. These zones are associated with the Alert Area, Explosive Combat Aircraft parking, and the Munitions Storage Area. The Explosive Combat Aircraft parking area is within the vicinity of the proposed project site. Fairchild AFB is aggressively managing its development program to ensure that it meets explosive safety requirements. There are currently no electromagnetic radiation safety zones, antenna look-angles, or security clear zones that affect development on Fairchild AFB (FAFB 2009d).

Range sites on Fairchild AFB contain various munitions, unexploded ordnance (UXO), and Chemical Agent Identification Sets (CAIS). Most of the munitions, UXO, and CAIS on the surface have been removed. However, munitions, UXO, and CAIS still can be found below the ground surface. The proposed project site is not within range sites; therefore, there is an extremely low potential for encountering munitions, UXO, and CAIS at the proposed project site (FAFB 2007c).

3.10.3 Environmental Consequences

3.10.3.1 Proposed Action

3.10.3.1.1 Repairing Runway 05/23 and Replacing Airfield Lighting Systems

Short-term, negligible to minor, adverse impacts would be expected from the Proposed Action during C&D activities; however, no long-term operational safety impacts would be expected. Risk to contractors would be minimal since contractors would be required to establish and maintain safety programs. Adherence to these established safety programs would help to reduce any potential construction safety risks associated with the Proposed Action. Work areas surrounding C&D activities would be fenced and appropriate signs posted to further reduce safety risks. Because there are no known range sites within the proposed project site and public access to the proposed project site is restricted, no impacts associated with fire hazards or public safety would be expected. If inadvertent discovery of munitions, UXO, or CAIS occurs during construction or demolition activities, the contractor would be required to immediately stop work in the area, personnel would move away from the site, and the Fairchild AFB Explosive Ordnance Disposal Flight would be contacted.

3.10.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not repair Runway 05/23 or replace associated airfield lighting systems. Airfield runway and shoulder pavements would continue to degrade and would remain noncompliant with UFC 3-260-01 and UFC 3-260-02. Runway 05/23 would eventually reach the end of its useful life, which would hinder essential Fairchild AFB mission activities and increase FOD hazards to aircraft. No impacts on safety would be expected under the No Action Alternative.

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4. Cumulative and Other Effects

4.1 Definition of Cumulative Effects

CEQ defines cumulative effects as the “impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking is served by consideration of cumulative effects resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future. Reasonably foreseeable future actions consist of activities that have been approved and can be evaluated with respect to their effects.

4.2 Projects Considered Potential Cumulative Effects

To identify cumulative effects, this analysis addresses two fundamental questions:

1. Does a relationship exist such that affected resource areas of the Proposed Action or alternatives might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
2. If such a relationship exists, then does an EA reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

The scope of the cumulative effects analysis involves both timeframe and geographic extent in which effects could be expected to occur, as well as a description of what resources could potentially be cumulatively affected. For the purposes of this analysis, the temporal span of the Proposed Action is 5 years. For most resources, the spatial area for consideration of cumulative effects is Fairchild AFB, with the exception of effects on air quality, which considers Spokane County as the region of influence (ROI), and socioeconomics, which has an ROI defined as the census tract containing Fairchild AFB and the adjacent census tracts. Similarly, impacts on resources and conditions of activities attributable to other actions within the ROI would not augment the direct and indirect effects of the installation development at Fairchild AFB to the extent that they would significantly increase their effect. The actions identified for cumulative effects analysis include recently completed projects at Fairchild AFB and proposed projects expected to be completed in the near future. **Table 4-1** summarizes these projects.

4.3 Cumulative Effects on Resource Areas

The following summarizes potential cumulative effects on specific resources as a result of implementing the proposed Action, recently completed projects, and planned future projects.

Air Quality. Short-term, minor, adverse cumulative effects on air quality would be expected as result of the C&D activities associated with the Proposed Action in conjunction with recently completed projects and proposed projects. Cumulative effects from the Proposed Action and other planned foreseeable actions are not expected to have an adverse impact on local and regional air quality.

Safety. C&D activities associated with the Proposed Action and other foreseeable actions would increase short-term construction safety risks; however, no-long term operational safety impacts would be expected. These short-term safety risks would not be cumulatively significant.

Table 4-1. Projects Sited/Ongoing 2006/2007 Projects with Completed EAs

Project Location	Project Title	Status	Project Size (feet²)
Fairchild AFB	<i>Remove Asbestos/Demolish Building 2092</i>	Completed	20,000
Fairchild AFB	<i>Demolish Furniture Store, Building 620</i>	Completed	22,000
Fairchild AFB	<i>Demolish Dormitories, Building 622 and 623</i>	Completed	67,320
Fairchild AFB	<i>Construct Resistance Training Facility</i>	Completed	28,000
Fairchild AFB	<i>Construct Armed Forces Reserve Center Area Maintenance Support Activity/Organizational Maintenance Shop/Storage</i>	Scheduled for Completion in August 2009	156,000
Fairchild AFB	<i>Construct Vehicle Storage/Maintenance Facility, Ruby Creek</i>	Completed	5,000
Fairchild AFB	<i>Construct Vehicle/Equipment Storage Facility, Explosive Ordnance Disposal Building 2096</i>	Completed	3,800
Fairchild AFB	<i>Replace Jet Fuel Transfer Line/Upgrade Truck Off-Load</i>	In Design	11,000 (Linear feet)
Fairchild AFB	<i>Columbia Center Area Development Plan:</i> <ul style="list-style-type: none"> • Construct new Wing Headquarters Facility • Construct Airman Support Center Facility • Demolish existing Wing headquarters (Building 2285) 	Proposed	44,000
Fairchild AFB	<i>Community Center Area Development Plan:</i> <ul style="list-style-type: none"> • Construct a Physical Fitness Center and outdoor recreational fields • Demolish existing Fitness Center (Building 2249) • Construct a School Age Programs Facility and Medical Clinic • Remove Existing Softball Fields and Building 2301 (adjacent to Michael Anderson Elementary School) • Expand Eaker Avenue 	Proposed	86,000
Fairchild AFB	<i>Civil Engineering Complex:</i> <ul style="list-style-type: none"> • Demolish Buildings 2009, 2010, 2011, and 2451. • Construct a consolidated Civil Engineering Complex. 	Proposed	121,000
City of Spokane	<i>Spokane IAP Runway Upgrade</i>	Under Construction	

Geological Resources. Short- and long-term, adverse cumulative effects on geological resources would be expected. The Proposed Action would result in short- and long-term, negligible to minor, adverse impacts on geological resources. The cumulative effect of proposed C&D activities associated with

proposed projects coupled with recent development would result in short-term, adverse cumulative effects associated with increased soil runoff and sedimentation.

Water Resources. C&D activities associated with the Proposed Action and other foreseeable actions would result in short-term, negligible to minor, adverse cumulative effects on water quality from a temporary increase in sedimentation resulting from an increase in ground disturbances and exposed soils. Long-term, beneficial cumulative effects would result from a decrease in impervious surfaces due to the reduced runway width. The cumulative effect of proposed development throughout the installation and other C&D activities would be short-term from increased soil runoff and sedimentation and long-term from an increase in impervious surfaces. Proposed projects would not be expected to increase potable water consumption.

Biological Resources. C&D activities associated with the Proposed Action and other foreseeable actions would result in short- and long-term, negligible to minor, adverse cumulative effects on wildlife and vegetation. New construction would be primarily limited to existing developed areas, which would minimize effects to existing native vegetation and animal habitat.

Cultural Resources. No cumulative effects on cultural resources would be expected.

Utilities and Infrastructure. Long-term, beneficial cumulative effects would be expected on utilities and infrastructure. The proposed projects and recently completed projects at Fairchild AFB would repair and upgrade roads, utilities, and facilities so they can support the mission at Fairchild AFB. A short-term, minor, cumulative effect could occur on utilities during construction of the proposed projects; however, no long-term cumulative effect would be expected.

Hazardous Materials and Wastes. Minor, adverse cumulative effects could occur as a result of the short- and long-term increases in hazardous materials and wastes associated with the proposed projects. Growth of industrial uses adjacent to the installation could increase hazardous waste and waste management requirements for the local area. Fairchild AFB is not expected to add to this increase over the existing usage. No significant adverse cumulative effects on hazardous materials and waste management would be expected.

Transportation. Short-term, minor, adverse cumulative effects would occur on the transportation system at Fairchild AFB and surrounding community transportation systems from the increase in construction traffic. However, no long-term cumulative effects would be expected from the Proposed Action and other proposed projects at Fairchild AFB.

4.4 Compatibility of Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

Impacts on the ground surface as a result of the Proposed Action would occur entirely within the boundaries of Fairchild AFB. Construction activities would not result in any significant or incompatible land use changes on- or off-installation. The proposed project is at a location consistent with current and future land use zones. Consequently, construction activities would not be in conflict with future installation land use policies or objectives. The Proposed Action would not conflict with any applicable off-installation land use ordinances or designated clear zones.

4.5 Relationship Between Short-Term Uses of Man's Environment and Maintenance and Enhancement of Long-Term Productivity

Short-term uses of the biophysical components of man's environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of man's environment include those impacts occurring over a period of more than 5 years, including permanent resource loss.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in an intensification of land use at Fairchild AFB and in the surrounding area. Development of the Proposed Action would not represent a significant loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or aesthetic impacts. Long-term productivity of these sites would be increased by the implementation of the Proposed Action.

4.6 Irreversible and Irretrievable Commitment of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, land, biological habitat, and human resources. The use of these resources is considered to be permanent.

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources would have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (i.e., energy and minerals).

Material Resources. Material resources used for the Proposed Action include building materials (for construction of facilities) and various material supplies (for infrastructure). Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources consumed for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel) and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. Consumption of energy resources would not place a significant demand on their availability in the region. Therefore, no significant effects would be expected.

Biological Resources. The Proposed Action would result in a minimal, temporary loss of vegetation and wildlife habitat at the proposed construction area. However, proposed construction is mostly occurring on already disturbed land and is poor wildlife habitat.

Human Resources. The use of human resources for construction and operation is considered an irretrievable loss, but only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action also represents employment opportunities and is considered beneficial.

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APPENDIX A

APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix A

Applicable Laws, Regulations, Policies, and Planning Criteria

When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws as well as Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

NOTE: This is not a complete list of all applicable laws, regulations, policies, and planning criteria potentially applicable to documents, however, it does provide a general summary for use as a reference.

Airspace

Airspace management in the U.S. Air Force (USAF) is guided by Air Force Instruction (AFI) 13-201, *Air Force Airspace Management*. This AFI provides guidance and procedures for developing and processing special use airspace (SUA). It covers aeronautical matters governing the efficient planning, acquisition, use, and management of airspace required to support USAF flight operations. It applies to activities that have operational or administrative responsibility for using airspace and establishes practices to decrease disturbances from flight operations that might cause adverse public reaction and provides flying unit commanders with general guidance for dealing with local problems.

Noise

The Air Installation Compatible Use Zone (AICUZ) Program, (AFI 32-7063), provides guidance to air installations and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near USAF installations.

Land Use

Land use planning in the USAF is guided by *Land Use Planning Bulletin, Base Comprehensive Planning* (HQ USAF/LEEVX, August 1, 1986). This document provides for the use of 12 basic land use types found on a USAF installation. In addition, land use guidelines established by the U.S. Department of Housing and Urban Development (HUD) and based on findings of the Federal Interagency Committee on Noise (FICON) are used to recommend acceptable levels of noise exposure for land use.

Air Quality

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQSs) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance as well as leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment to pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCR). Pollutant concentration levels are measured at

designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassifiable. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction as well as long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states all Federal agencies will comply with all Federal- and state-approved requirements.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS, contribute to an increase in the frequency or severity of violations of NAAQS, or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 Code of Federal Regulations (CFR) 93.153. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

Safety

AFI 91-202, *USAF Mishap Prevention Program*, implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information. This instruction applies to all USAF personnel.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements AFPD 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

Geological Resources

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act (FPPA) to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland (7 CFR Part 658). Prime farmland are soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, deep or thick effective rooting zones, and are not subject to periodic flooding. Under the FPPA, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject to the FPPA include

Federal permitting and licensing, projects on land already in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

Water Resources

The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water-quality standards and to develop TMDLs. A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water-quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the Nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone, through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Development projects affecting land or water use or natural resources of a coastal zone, must ensure the project is, to the maximum extent practicable, consistent with the state's coastal zone management program.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human health effects are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse impacts and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted flood proofing and flood protection to include elevating structures above the base flood level rather than filling in land.

Biological Resources

The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of Critical Habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintain the list. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States might also have their own lists of threatened and endangered species, which can be obtained by calling the appropriate State Fish and Wildlife office. Some species, such as the bald eagle, also have laws specifically for their protection (e.g., Bald and Golden Eagle Protection Act).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport or carry from one state, territory, or district to another, or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

EO 11514, *Protection and Enhancement of Environmental Quality* (March 5, 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse impacts and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. EO 13186 provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a MOU. EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how Federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

Cultural Resources

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency official to identify properties in the area of potential effect, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 establishes rights of American Indian tribes to claim ownership of certain "cultural items," defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies. Cultural items discovered on Federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on Federal or tribal land must be reported to the appropriate American Indian tribe and the Federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971), directs the Federal government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all Federal sites under their jurisdiction or control which might qualify for listing on the NRHP. Agencies must allow the ACHP to

comment on the alteration, demolition, sale, or transfer of property which is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of Federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

EO 13007, *Indian Sacred Sites* (May 24, 1996), provides that agencies managing Federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners' access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13287, *Preserve America* (March 3, 2003), orders Federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

Socioeconomics and Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental impacts that its activities have on minority and low-income populations and develop agency wide environmental justice strategies. The strategy must list "programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations." A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each Federal agency.

Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal "Superfund" to respond to emergencies immediately. Although the "Superfund" provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is

authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters.

The Pollution Prevention Act (PPA) of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes, redesigning products, substituting raw materials, and making improvements in management techniques, training, and inventory control. Consistent with pollution prevention principles, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007 [revoking EO 13148]) sets a goal for all Federal agencies that promotes environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and use of paper of at least 30 percent post-consumer fiber content. In addition, EO 13423 sets a goal that requires Federal agencies to ensure that they reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of, increase diversion of solid waste as appropriate, and maintain cost effective waste prevention and recycling programs in their facilities. Additionally, in *Federal Register* Volume 58 Number 18 (January 29, 1993), CEQ provides guidance to Federal agencies on how to “incorporate pollution prevention principles, techniques, and mechanisms into their planning and decisionmaking processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA.”

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for “cradle-to-grave” management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA amendments strengthen control of both hazardous and nonhazardous waste and emphasize the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act, which requires facility operators with “hazardous substances” or “extremely hazardous substances” to prepare comprehensive emergency plans and to report accidental releases. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency can also incur liability if it leases a property, as the courts have found lessees liable as “owners.” However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim the “innocent purchaser” defense under CERCLA. According to Title 42 United States Code (U.S.C.) 9601(35), the current owner/operator must show it undertook “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice” before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment. TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II

provides statutory framework for “Asbestos Hazard Emergency Response,” which applies only to schools. TSCA Title III, “Indoor Radon Abatement,” states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, “Lead Exposure Reduction,” directs Federal agencies to “conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards.” Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

APPENDIX B

**INTERAGENCY AND INTERGOVERNMENTAL COORDINATION
FOR ENVIRONMENTAL PLANNING (IICEP) MATERIALS AND NOTICE OF
AVAILABILITY (NOA)**

Appendix B

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Materials and Notice of Availability (NOA)

IICEP LETTER, IICEP DISTRIBUTION LIST, AND AGENCY COMMENTS FOR THE DRAFT EA AND FONSI

The Draft EA and FONSI were made available to the agencies listed below for a 30-day review period. A copy of the IICEP letter, comments received, and responses to comments received are included below.

Mr. Dave Duncan, Water Quality
Washington State Department of Ecology
North 4601 Monroe
Spokane, WA 99205-1295

Spokane International Airport
Attn: Planning Division
9000 W Airport Dr, Suite 204
Spokane, WA 99224

Ms. Allyson Brooks, State Historic Preservation
Officer
Department of Archaeology & Historic
Preservation
1063 South Capitol Way, Suite 106
Olympia WA 98501

Grant County International Airport
Attn: Planning Division
7810 Andrews St. N.E., Suite 200
Moses Lake, WA 98837

Mr. John Andrews, Regional Director
Washington Department of Fish and Wildlife
2315 North Discovery Place
Spokane Valley, WA 99216-1566

Public Works Building and Planning
Public Works Building
Attn: Planning Division
1026 W. Broadway Ave
Spokane, WA 99260

Mr. Joe Southwell, Air Quality Engineer
Spokane Regional Clean Air Agency
3104 E. Augusta Ave
Spokane, WA 99207-5384

Community Development
The City of Moses Lake
Attn: Planning Division
P.O. Box 1579
Moses Lake, WA 98837

Upper Columbia Fish and Wildlife Office
Attn: NEPA Program Coordinator
11103 E. Montgomery Drive
Spokane Valley, WA 99206

City of Airway Heights
Attn: Planning Department
13120 W. 13th Ave
Airway Heights, WA 99001

Grant County Planning
Attn: Planning Division
P.O. Box 37
Ephrata, WA 98823

Spokane Public Library
906 West Main Avenue
Spokane, WA 99201

North Central Regional Library, Moses Lake
418 East 5th Avenue
Moses Lake, WA 98837-1797



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 92D AIR REFUELING WING (AMC)
FAIRCHILD AIR FORCE BASE WASHINGTON

MEMORANDUM FOR: SEE DISTRIBUTION LIST

SEP 22 2009

FROM: 92 CES/CEA
100 West Ent Street, Suite 155
Fairchild AFB, Washington 99011

SUBJECT: Environmental Assessment (EA) for Review and Comment

Air Mobility Command (AMC) and the 92nd Air Refueling Wing (ARW) have prepared a Draft EA addressing *Repair of Runway 05/23 at Fairchild Air Force Base, Washington*. The Environmental Impact Analysis Process for this proposal is being conducted by AMC and 92nd ARW in accordance with Council on Environmental Quality regulations pursuant to the requirements of the National Environmental Policy Act of 1969. The *Draft EA Addressing the Repair of Runway 05/23 at Fairchild Air Force Base, Washington* is included with this correspondence as Attachment 1.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation by reviewing the attached Draft EA and solicit your comments concerning the proposal and any potential environmental consequences. Please provide written comments or information regarding the action at your earliest convenience but no later than 30 days from the date of this letter. Appendix B of the Draft EA contains a listing of those Federal, state, and local agencies that have been contacted. If there are any additional agencies that you feel should review and comment on the proposed activities, please include them in your distribution of this letter and the attached materials.

Please address questions or comments on the proposed repair of Runway 05/23 to the 92nd Air Refueling Wing, Public Affairs Office, Fairchild AFB, Washington, 99011. Thank you for your assistance.

Sincerely,



GERALD T. JOHNSON
Chief, Asset Management Flight

Attachments:

1. *Draft Environmental Assessment Addressing the Repair of Runway 05/23 at Fairchild Air Force Base, Washington*

City of Airway Heights
Planning Department
1208 S. Lundstrom St.
Airway Heights, WA 99001
Tel (509) 244-2552 - Fax (509) 244-4746
Email: dbraaten@cawh.org



October 15, 2009

RE: FAFB Repair of Runway 05/23

To Whom It May Concern:

The City of Airway Heights would like to thank you for the opportunity to comment on the EIS for the proposed repair of runway 05/23. The City has some concern relating to the routing of trucks along Highway US-2. It is unclear from the EA where materials not reused will be located after the project is completed. Will this material be moved off-installation or stored on site? If it is to be moved off-installation, by what route will it be transported?

Also, the City of Airway Heights would like clarification as to which "borrow pits" will be used for the proposed project. The EA only indicates it assumes the contractor will use pits within a 30 mile radius. Depending on the location of said pits, such traffic may have a negative impact on traffic along Highway US-2. Airway Heights would like to review the proposed routing of these trucks prior to project start to ensure any negative impacts from this potential traffic are mitigated.

Again, we thank you for the opportunity to comment on this project. Please feel free to contact us at (509) 244-2552, with any questions.

Sincerely,

Derrick Braaten
Interim City Planner



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 92D AIR REFUELING WING (AMC)
FAIRCHILD AIR FORCE BASE WASHINGTON

92d CES/CEA
100 West Ent Street, Suite 155
Fairchild AFB, WA 99011

OCT 28 2009

City of Airway Heights
Planning Department
Attn: Mr. Derrick Braaten, Interim City Planner
1208 S. Lundstrom Street
Airway Heights, WA 99001

Dear Mr. Braaten,

Thank you for your comments provided on the Draft *Environmental Assessment Addressing the Repair of Runway 05/23 at Fairchild Air Force Base, Washington*. As required by the National Environmental Policy Act (NEPA) and Air Force regulations, Fairchild AFB will take into consideration your comments relative to importing borrow materials to the base, the disposition of unused materials, and the potential impacts to local traffic using U.S. Route 2.

The environmental assessment must be completed prior to selecting a construction contractor to complete the runway repair project. It is unknown at this time where the contractor will obtain borrow and aggregate materials meeting project requirements. It is assumed that local borrow pits will be used to minimize costs and to meet mission time constraints. The chosen contractor will be required to use U.S. Environmental Protection Agency (USEPA)-approved borrow pits, which meet runway construction requirements. A number of borrow pits within a 30-mile radius meet these requirements.

All excess borrow and aggregate materials will be transported off Fairchild AFB to USEPA-approved borrow pits or reused for other construction projects at the discretion of the selected construction contractor. All construction transportation access to Fairchild AFB will be from U.S. Route 2 to Rambo Road and through our commercial gate. According to the analysis of transportation effects in the environmental assessment, construction traffic will have minor, short-term impacts on local traffic along U.S. Route 2. Once a construction contractor has been chosen and construction haul routes and borrow pits have been established, a representative from Asset Management will coordinate with the local planning departments of municipalities along the transportation route.

Please address any further questions or comments on the proposed repair of Runway 05/23 to the 92nd Air Refueling Wing, Public Affairs Office, Fairchild AFB, Washington, 99011. Thank you for your comments.

Sincerely,


GERALD T. JOHNSON
Chief, Asset Management Flight



ENVIRONMENTAL ASSESSMENT
FAIRCHILD AFB REPAIR RUNWAY 05/23
RECORD OF COMMUNICATION (ROC)

Name:	Mr. Joe Southwell
Date of Correspondence:	9/29/09
Project:	Fairchild AFB Repair Runway 05/23
Correspondence From:	Mr. Joe Southwell (SRCAA)
Correspondence To:	Ms. Kristin Nester (92nd CES/CEAN)

Contact Information

Name:	Mr. Joe Southwell
Title:	Air Quality Engineer
Org./Office:	Spokane Regional Air Agency
Address:	3104 East Augusta Avenue Spokane, Washington 99207
Phone:	509-477-4727
Email:	jsouthwell@spokanecleanair.org
Other:	

Description of Correspondence:

Email correspondence from Mr. Southwell to Ms. Nester.

RE: Draft EA for Runway Repair Project

From: Nester, Kristin A Civ USAF AMC 92 CES/CEAN
Sent: Tuesday, September 29, 2009 10:37 AM
To: Wald, Jonathan A Civ USAF AMC 92 CES/CEAO
Cc: Johnson, Gerald T Civ USAF AMC 92 CES/CEA
Subject: FW: Draft EA for runway repair project

Jonathan,
FYI for your records. I told Joe no formal reply required.

- Kristin
// SIGNED //
KRISTIN A. NESTER
Chief, Natural Resources Mngt

-----Original Message-----

From: Joe Southwell [mailto:JSouthwell@spokanecleanair.org]

Sent: Tuesday, September 29, 2009 10:13 AM

To: Nester, Kristin A Civ USAF AMC 92 CES/CEAN

Subject: Draft EA for runway repair project

Hi Kristen,

SRCAA received a copy of the runway repair project draft EA and I wanted to touch base with you on it.

I looked over the air quality section of draft EA; I thought it adequately addressed air quality impact and permitting issues and had no comments. I noted that the EA contained a cover letter requesting any comments we may have. Would you let me know if FAFB requires a formal response?

Thanks (and sorry for the phone tag over the last several days).

Joe Southwell

Air Quality Engineer

Spokane Regional Clean Air Agency

Phone: 509-477-4727 ext 103

Fax: 509-477-6828

e-mail: jsouthwell@spokanecleanair.org <<mailto:jsouthwell@spokanecleanair.org>>

The Draft EA and FONSI were made available to the public for a 30-day review period. The NOA was published on 24 September 2009 in the *Spokane Spokesman Review* and *Moses Lake Columbia Basin Herald*.

PUBLIC NOTICE

Notice of Availability

ENVIRONMENTAL ASSESSMENT (EA) ADDRESSING THE REPAIR OF RUNWAY 05/23 AT FAIRCHILD AIR FORCE BASE, WASHINGTON

The U.S. Air Force (USAF) at Fairchild Air Force Base (AFB), Washington proposes to repair Runway 05/23, demolish an inadequate airfield lighting vault (Building 1101), expand an airfield lighting vault (Building 2014), and replace and relocate airfield lighting systems. During Runway 05/23 closure, Fairchild AFB would temporarily relocate aircraft, personnel, and equipment to Spokane International Airport (IAP) and Grant County IAP. The objective of the EA is to address the potential for significant environmental impacts. In accordance with the National Environmental Policy Act, the USAF is required to prepare an EA, and provide this environmental documentation to the public for review.

Copies of the Draft EA and Finding of No Significant Impact (FONSI) are available for review at the Spokane Public Library, 906 West Main Avenue, Spokane, Washington 99201. Copies can also be obtained by calling (509) 247-5706.

The review period for this EA is thirty (30) days from the date of this publication. Please address written comments and inquiries regarding this document to 92nd Air Refueling Wing, Public Affairs Office, Fairchild Air Force Base, Washington 99011-9688, Attn: Mr. Jonathan Wald. All written comments must be postmarked by 23 October 2009 to be considered in the Final EA and FONSI.

Figure B-1. NOA for Spokane *Spokesman Review*

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Notice of Availability

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Figure B-2. Spokane *Spokesman Review* Newspaper Publication Tear Sheet

PUBLIC NOTICE

Notice of Availability

ENVIRONMENTAL ASSESSMENT (EA) ADDRESSING THE REPAIR OF RUNWAY 05/23 AT FAIRCHILD AIR FORCE BASE, WASHINGTON

The U.S. Air Force (USAF) at Fairchild Air Force Base (AFB), Washington proposes to repair Runway 05/23, demolish an inadequate airfield lighting vault (Building 1101), expand an airfield lighting vault (Building 2014), and replace and relocate airfield lighting systems. During Runway 05/23 closure, Fairchild AFB would temporarily relocate aircraft, personnel, and equipment to Spokane International Airport (IAP) and Grant County IAP. The objective of the EA is to address the potential for significant environmental impacts. In accordance with the National Environmental Policy Act, the USAF is required to prepare an EA, and provide this environmental documentation to the public for review.

Copies of the Draft EA and Finding of No Significant Impact (FONSI) are available for review at the North Central Regional Library, Moses Lake, 418 East 5th Avenue, Moses Lake, Washington 98837. Copies can also be obtained by calling (509) 247-5706.

The review period for this EA is thirty (30) days from the date of this publication. Please address written comments and inquiries regarding this document to 92nd Air Refueling Wing, Public Affairs Office, Fairchild Air Force Base, Washington 99011-9688, Attn: Mr. Jonathan Wald. All written comments must be postmarked by 23 October 2009 to be considered in the Final EA and FONSI.

Figure B-3. NOA for Moses Lake *Columbia Basin Herald*

PUBLIC NOTICE

Notice of Availability

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Figure B-4. Moses Lake *Columbia Basin Herald* Newspaper Publication Tear Sheet

APPENDIX C

AIR QUALITY CONFORMITY ANALYSIS

Appendix C

Air Quality Conformity Analysis

Summary	Summarizes total emissions by calendar year.
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Concrete Batching	Estimates emissions from concrete batch plant operations.
Rock Crushing	Estimates emissions from rock crushing operations.
Asphalt Batching	Estimates emissions from asphalt batch plant operations.
Haul Truck On-Road	Estimates emissions from haul trucks delivering materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Aircraft Emissions	Estimates increase in emissions from KC-135R aircraft at Grant County IAP and Spokane IAP during Runway 05/23 closure.
AQCR Tier Report	Summarizes total emissions for the Eastern Washington- Northern Idaho Interstate Air Quality Control Region Tier report for 2002, to be used to compare the project to regional emissions.

Air Quality Emissions from Repairing Runway 05/23 and Replacing Airfield Lighting Systems

	NO _x (ton)	VOC (ton)	CO (ton)	SO ₂ (ton)	PM ₁₀ (ton)	PM _{2.5} (ton)	CO ₂ (ton)
CY2010							
Construction Combustion	80.916	4.888	32.292	1.853	4.946	4.797	9,479.497
Construction Fugitive Dust	-	-	-	-	204.403	18.693	-
Concrete Batching	-	-	-	-	4.953	-	-
Rock Crushing	-	-	-	-	0.191	0.024	-
Asphalt Batching	0.119	0.039	1.910	0.022	21.483	1.289	176.636
Haul Truck On-Road	3.778	2.732	11.101	0.298	4.493	1.168	956.399
Construction Commuter	0.275	0.274	2.479	0.003	0.026	0.016	328.705
TOTAL CY2010	85.088	7.933	47.781	2.176	240.494	25.987	10,941.236

Note: Total CY2010 PM_{10/2.5} fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO₂ emissions converted to metric tons = **9,923.701 metric tons**

Air Emissions at Grant County IAP from Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure

	NO _x (ton)	VOC (ton)	CO (ton)	SO ₂ (ton)	PM ₁₀ (ton)	PM _{2.5} (ton)
CY2010						
Aircraft Emissions	71.817	1.843	71.461	7.584	23.754	23.754
TOTAL CY2010	71.817	1.843	71.461	7.584	23.754	23.754

Air Emissions at Spokane IAP from Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure

	NO _x (ton)	VOC (ton)	CO (ton)	SO ₂ (ton)	PM ₁₀ (ton)	PM _{2.5} (ton)
CY2010						
Aircraft Emissions	22.014	0.875	30.731	2.531	10.231	10.231
TOTAL CY2010	22.014	0.875	30.731	2.531	10.231	10.231

Summary

Since future year budgets were not readily available, actual 2002 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Eastern Washington- Northern Idaho Interstate Air Quality Control Region

Year	Point and Area Sources Combined					
	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
2002	51,880	74,049	386,986	3,984	154,734	28,185

Source: USEPA-AirData NET Tier Report (<http://www.epa.gov/air/data/geosel.html>). Site visited on 25 May 2009.

**Air Emissions from Repairing Runway 05/23 and Replacing Airfield Lighting Systems
Determination Significance (Significance Threshold = 10% of regional)**

CY2010

Regional Emissions
CY2010 Emissions
% of Regional

Point and Area Sources Combined						
NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	
51,880	74,049	386,986	3,984	154,734	28,185	
85.09	7.93	47.78	2.18	240.49	25.99	
0.164%	0.011%	0.012%	0.055%	0.155%	0.092%	

**Air Emissions at Grant County IAP from Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure
Determination Significance (Significance Threshold = 10% of regional)**

CY2010

Regional Emissions
CY2010 Emissions
% of Regional

Point and Area Sources Combined						
NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	
51,880	74,049	386,986	3,984	154,734	28,185	
71.82	1.84	71.46	7.58	23.75	23.75	
0.138%	0.002%	0.018%	0.190%	0.015%	0.084%	

**Air Emissions at Spokane IAP from Temporary Relocation of Aircraft, Personnel, and Equipment During Runway 05/23 Closure
Determination Significance (Significance Threshold = 100 tpy of CO, 100 tpy of PM₁₀ or 10% of regional)**

CY2010

Regional Emissions
CY2010 Emissions
% of Regional

Point and Area Sources Combined						
NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	
51,880	74,049	386,986	3,984	154,734	28,185	
22.01	0.88	30.73	2.531	10.23	10.23	
0.042%	0.001%	0.008%	0.064%	0.007%	0.036%	

Summary

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO₂, CO, PM_{2.5}, PM₁₀, and CO₂ due to Construction

General Construction Activities		Area Disturbed	
Construction Staging Area		1,245,198 ft ²	
Replace six storm water pipes		119,060 ft ²	Assume 20 foot wide construction corridor (FAFB 2009, Figure C-6.1)
Expand Building 2014 southwest approximately 20 feet		800 ft ²	
Demolish Building 1101		215 ft ²	
Install overhead electric lines along Thorpe Rd		31,000 ft ²	Assume 20 foot construction corridor
Install underground electric lines along Taxiway K		62,000 ft ²	Assume 20 foot construction corridor
Upgrade haul road along Rambo Rd (4,800 linear feet)		144,000 ft ²	Assume 30 foot wide construction corridor
Runway Construction and Demolition Activities			
Demolish and Pave Runway		3,515,060 ft ²	Includes pavement, overruns, and portions of attached taxiways Area determined from FAFB 2009, Figure C-6.1
Total General Construction Area:		1,602,273 ft ²	
		36.8 acres	
Total Runway Construction and Demolition Area:		3,515,060 ft ²	
		80.7 acres	
Total Disturbed Area:		5,117,333 ft ²	
		117 acres	
Construction Duration:		10 months	
Annual Construction Activity:		200 days/yr	Assume 10 months, 4 weeks per month, 5 days per week.

Combustion

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0

Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.

Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	0.83	2.55	2.47	4941.53

Paving

Equipment	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	0.91	2.78	2.69	5623.96

Demolition

Equipment	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	0.64	1.92	1.87	3703.07

Building Construction

Equipment ^d	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Combustion

Architectural Coatings

Equipment	No. Reqd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

- The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.
- The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO₂ emissions by more than a factor of two.
- Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

Combustion

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO _x	VOC	CO	SO ₂ **	PM ₁₀	PM _{2.5}	CO ₂
Grading Equipment	12	499.695	30.924	188.519	9.994	30.546	29.630	59298.316
Paving Equipment	8	362.938	20.846	148.627	7.259	22.209	21.543	44991.655
Demolition Equipment	8	254.461	15.084	100.670	5.089	15.386	14.924	29624.589
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			2.305					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO_x = (Total Grading NO_x per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft ²)	Total Area (acres)	Total Days	
Grading:	5,117,333	117.48	6	(from "CY2010 Grading" worksheet)
Paving:	3,659,060	84.00	50	
Demolition:	3,634,335	83.43	521	
Building Construction:	800	0.02	200	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)
Architectural Coating	800	0.02	20	

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
Grading Equipment	2,998.17	185.54	1,131.11	59.96	183.28	177.78	355,790
Paving	18,192.28	1,044.89	7,449.95	363.85	1,113.21	1,079.82	2,255,207
Demolition	132,689.85	7,865.70	52,494.97	2,653.80	8,022.85	7,782.17	15,447,900
Building Construction	7,879.26	625.96	3,476.46	623.27	565.81	548.83	892,902
Architectural Coatings	71.48	53.57	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	161,831.04	9,775.67	64,583.81	3,705.90	9,891.34	9,594.60	18,958,994

Results: Total Project Annual Emission Rates

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
Total Project Emissions (lbs)	161,831.04	9,775.67	64,583.81	3,705.90	9,891.34	9,594.60	18,958,994
Total Project Emissions (tons)	80.92	4.89	32.29	1.85	4.95	4.80	9,479.50

Combustion

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM ₁₀ /acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM ₁₀ /acre-month	MRI 1996; EPA 2001; EPA 2006
PM_{2.5} Emissions			
PM _{2.5} Multiplier	0.10	(10% of PM ₁₀ emissions assumed to be PM _{2.5})	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM ₁₀ and PM _{2.5} emissions)	EPA 2001; EPA 2006

Project Assumptions

Demolition and New Runway Construction (0.42 ton PM₁₀/acre-month)

Duration of Construction Project	10 months
Area	80.7 acres

Construction Activities (0.19 ton PM₁₀/acre-month)

Duration of Construction Project	10 months
Area	36.8 acres

	Project Emissions (tons/year)			
	PM ₁₀ uncontrolled	PM ₁₀ controlled	PM _{2.5} uncontrolled	PM _{2.5} controlled
Demolition and New Runway Construction	338.92	169.46	33.89	16.95
Construction Activities	69.89	34.94	3.49	1.75
Total	408.81	204.40	37.39	18.69

Fugitive

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM₁₀/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM₁₀/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM₁₀/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM₁₀/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM₁₀/acre-month) and 75% of the average emission factor (0.11 ton PM₁₀/acre-month). The 0.19 ton PM₁₀/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM₁₀/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM₁₀ and PM_{2.5} in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM₁₀/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM₁₀/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM₁₀/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

PM_{2.5} Multiplier

0.10

PM_{2.5} emissions are estimated by applying a particle size multiplier of 0.10 to PM₁₀ emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM₁₀ and PM_{2.5}

0.50

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM₁₀ and PM_{2.5} in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999*. EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants*. Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1)*. Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Fugitive

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 117.5 acres/yr (from Combustion Worksheet)
Qty Equipment: 36.0 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project- specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	117.48	14.68
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	117.48	57.43
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	58.74	59.23
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	58.74	24.30
2315 310 5020	Compaction	Vibrating roller, 6" lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	117.48	41.20
TOTAL								196.85

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 196.85
Qty Equipment: 36.00
Grading days/yr: 5.47

Grading

Concrete Batch Plant Emissions

Fugitive dust emissions from the portable concrete batch plant are estimated on this sheet.

Concrete batch plant is powered by electric.

Emission Estimation Method: U.S. EPA AP-42 Section 11.12 "Concrete Batching" (June 2006)

Estimated amount of concrete to be produced = 105,500 cubic yards (yd³)

Concrete Batch Plant Emission Factors (lb pollutant/yd³ produced)

Operation	PM ₁₀	Arsenic	Beryllium	Cadmium	Total Chromium	Lead	Manganese	Nickel	Selenium
Aggregate Delivery	0.0031								
Sand Delivery	0.00070								
Aggregate Transfer to Conveyor	0.0031								
Sand Transfer to Conveyor	0.0007								
Storage	0.0031								
Sand Transfer to Elevated Storage	0.00070								
Cement Delivery to Silo	0.00010	1.04E-09	1.19E-10	1.19E-10	7.12E-09	2.68E-09	2.87E-08	1.03E-08	--
Cement Supplement Delivery to Silo	0.00020	3.65E-08	3.30E-09	7.23E-12	4.45E-08	1.90E-08	9.34E-09	8.32E-08	2.64E-09
Weigh Hopper Loading	0.0038								
Truck Mix Loading	0.078	8.57E-07	6.88E-08	9.64E-09	3.21E-06	1.02E-06	1.73E-05	3.36E-06	7.39E-07
Total	0.094	8.95E-07	7.22E-08	9.77E-09	3.27E-06	1.04E-06	1.73E-05	3.45E-06	7.41E-07

Reference: U.S. EPA AP-42 Section 11.12 Concrete Batching (June 2006), Table 11.12-5 Plant Wide Emission Factors Per Yard of Truck Mix Concrete (June 2006) and Table 11.12-8 Concrete Batch Plant Metal Emission Factors (June 2006). Factors reflect baghouse control for cement and supplement delivery to silo. Although some additional control is expected, the details of this operation are unknown, so uncontrolled emission factors have been used for processes other than silo loading. If water spray is effectively used throughout this process, actual emissions will be approximately 1/10 of the values shown.

Concrete Composition (1 yard)

Coarse Aggregate	1865 lbs
Sand	1428 lbs
Cement	491 lbs
Cement supplement	73 lbs
Water	167 lbs (20 gallons)
Total	4024 lbs

Reference: Footnote 'a' to AP-42 Table 11.12-8

Metal emission factors are provided in AP-42 in units of lbs per ton of ingredient. Therefore, the composition data above were used to convert emission factors from lb/ton ingredient to lbs/yd of concrete produced. (e.g. truck mix loading factors are reported in lbs emitted per ton of cement+supplement)

Each cubic yard of concrete contains 491+73= 564 lbs of these ingredients. Therefore (lb/ton ingred)*(564/2000) = lb/yd concrete

Concrete Batch Plant Emissions

	PM ₁₀	Arsenic	Beryllium	Cadmium	Total Chromium	Lead	Manganese	Nickel	Selenium
lbs/year	9906.03	0.094	0.0076	0.0010	0.34	0.11	1.82	0.36	0.078
tons/year	4.95	4.72E-05	3.81E-06	5.15E-07	1.72E-04	5.50E-05	9.12E-04	1.82E-04	3.91E-05

Example Calculation: PM₁₀ emissions (lbs) = cubic yards of concrete produced * Total PM₁₀ emission factor (0.094 lb/yd³ produced)

Total HAP emissions = 2.82 lb/yr

Concrete Batching

Rock Crushing Emissions

Fugitive dust emissions from rock crushing operations are estimated on this sheet.

Rock crushers are powered by electric.

Emission Estimation Method: U.S. EPA AP-42 Section 11.9.2 Crushed Stone Processing and Pulverized Mineral Processing (August 2004)

Assumptions:

All material generated onsite from demolition of the runway will be processed through the rock crusher(s).

This includes the following materials in the assumed volumes below:

	Volume (yd ³)	Volume (ft ³)	Weight (lbs)	Weight (tons)
Aggregate	19,420	524,340	78,651,000	39,326
Concrete	83,100	2,243,700	336,555,000	168,278
Asphalt	40,000	1,080,000	162,000,000	81,000
Total				288,603

Conservatively assume density of concrete demolition waste (estimated at 150 lb/ft³) is equal to density of aggregate and asphalt demolition waste.

conversion: 1 yd³ = 27 ft³

material weight (lbs) = ft³ * density (150 lb/ft³)

Rock Crushing Operation Emission Factors (lb pollutant/ton processed)

Operation	PM ₁₀	PM _{2.5}
Crushing	0.00054	0.0001
Screening	0.00074	0.00005
Conveyor Transfer	0.000046	0.000013
Total	0.0013	0.00016

Reference: U.S. EPA AP-42 Section 11.9.2 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-2. Emission Factors for Crushed Stone Processing Operations (lb/ton) (August 2004). Emission factors reflect water spray controls.

	PM ₁₀		PM _{2.5}	
	(lbs)	(tons)	(lbs)	(tons)
Rock Crushing Emission:	382.69	0.1913	47.04	0.02352

Example Calculation: PM₁₀ emissions (lbs) = tons of material processed * Total PM₁₀ emission factor (0.0013 lb/ton processed)

Rock Crushing

Asphalt Batch Plant Emissions

Fugitive dust emissions and rotary dryer emissions from asphalt batch plant operation are estimated on this sheet.

Emission Estimation Method: U.S. EPA AP-42 Section 11.1 Hot Mix Asphalt Plants (March 2004)

Assumptions:

Asphalt batch plant rotary dryer is fueled by natural gas.

Estimated volume of asphalt to be produced = 10,250 cubic yards (yd³)

276,750 cubic feet (ft³)

Estimated density of the asphalt product = 69 lb/ft³

Estimated weight of asphalt produced = 19095750 lbs asphalt weight (lbs) = volume (ft³) * density (lb/ft³)
9548 tons

Asphalt Batch Plant Emission Factors (lb pollutant/ton product)

Operation	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
Dryer, Hot Screens, Mixer	0.025	0.0082	0.40	0.0046	4.5	0.27	37

Reference: U.S. EPA AP-42 Section 11.1 Hot Mix Asphalt Plants. Emission factors from Table 11.1-2. *Summary of Particle Size Distribution for Batch Mix Dryers, Hot Screens, and Mixers*, Table 11.1-5 *Emission Factors for CO, CO₂, NO_x, and SO₂ from Batch Mix Hot Mix Asphalt Plants*, and Table 11.1-6 *Emission Factors for TOC, Methane, and VOC from Batch Mix Hot Mix Asphalt Plants*. Assume uncontrolled particulate emission factors and natural gas-fired dryer, hot screens, and mixer.

Asphalt Batch Plant Emissions

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
lbs	238.70	78.29	3819.15	43.92	42965.44	2577.93	353271.38
tons	0.12	0.04	1.91	0.02	21.48	1.29	176.64

Example Calculation: NO_x emissions (lbs) = tons of asphalt produced * NO_x emission factor (0.025 lb/ton product)

Asphalt Batch Plant Hazardous Air Pollutant (HAP) Emission Factors (lb pollutant/ton product)

Operation	Acetaldehyde	Benzene	Ethylbenzene	Formaldehyde	Quinone	Toluene	Xylene	Total PAH HAP ¹
CAS Registry Number	75-07-0	71-43-2	100-41-4	50-00-0	106-51-4	108-88-3	1330-20-7	--
Dryer, Hot Screens, Mixer	0.00032	0.00028	0.0022	0.00074	0.00027	0.0010	0.0027	0.00011

Reference: U.S. EPA AP-42 Section 11.1 Hot Mix Asphalt Plants. Emission factors from Table 11.1-9 *Emission Factors for Organic Pollutant Emissions from Batch Mix Hot Mix Asphalt Plants*.

¹ Total PAH HAP = total polycyclic aromatic hydrocarbons; the value presented here is the sum of the PAH HAP compounds listed in EPA AP-42 Table 11.1-9.

Asphalt Batch Plant HAP Emissions

	Acetaldehyde	Benzene	Ethylbenzene	Formaldehyde	Quinone	Toluene	Xylene	Total PAH HAP
lbs	3.06	2.67	21.01	7.07	2.58	9.55	25.78	1.05
tons	0.0015	0.0013	0.011	0.0035	0.0013	0.0048	0.013	0.001

Asphalt Batching

Haul Truck Emissions

Emissions from hauling the raw materials for concrete, asphalt and fill are estimated in this spreadsheet.

Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:

Haul trucks carry 20 cubic yards of material per trip.

The distance from the borrow pit is 30 miles, therefore the haul truck will travel 60 miles roundtrip.

Estimated number of trips required by haul trucks = total amount of material to be brought on installation/20 cubic yards per truck

Total amount of imported materials =	175,750 cubic yards	Reference: Material amounts table from Advent Environmental, May 2009
Number of trucks required =	8787.5 heavy duty diesel haul trucks	
Miles per trip =	60 miles	

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
HDDV	6.500	4.7000	19.10	0.512	7.7	2.01	1646

Notes:

Emission factors for all pollutants except CO₂ are from USAF IERA 2003.

Emission factors for PM, PM₁₀, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO₂ per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO₂ emission factor = 22.384 lbs CO₂/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
lbs	7555.39	5463.13	22201.22	595.13	8985.10	2336.36	1912798.06
tons	3.78	2.73	11.10	0.30	4.49	1.17	956.40

Example Calculation: NO_x emissions (lbs) = 60 miles per trip * 8787.5 trips * NO_x emission factor (g/mile) * lb/453.6 g

Haul Truck On-Road

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>.

Assumptions:

Passenger vehicle emission factors for scenario year 2010 are used

The average roundtrip commute for a construction worker = 60 miles
Number of construction days = 200 days
Number of construction workers (daily) = 50 people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

updated April 24, 2008. Available online: <<http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>>. Accessed 27 May 2009.

Notes:

The SCAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC

Construction Commuter Emissions

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
lbs	550.885	548.393	4957.654	6.465	52.187	32.869	657409.409
tons	0.275	0.274	2.479	0.0032	0.0261	0.0164	328.705

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

Construction Commuter

Aircraft Operational Emissions

Fairchild AFB would relocate approximately 15 KC-135 aircraft to Grant County IAP and five (5) KC-135 aircraft to Spokane IAP during the Runway 05/23 closure

Aircraft operations are based on 245 flight days in 2010 (31 January 2010 to 31 December 2010, Monday - Friday, with occasional weekends)

It is estimated that the aircraft relocated to Grant County IAP would conduct approximately 4 sorties (56 flight operations) per flying day (960 sorties/13,720 flight operations for the Proposed Action)

It is assumed that all sorties at Grant County IAP consist of one take-off and landing (two operations), two touch and gos (four operations), and four closed patterns (eight operations)

It is estimated that the aircraft relocated to Spokane IAP would conduct approximately 2 sorties (16 flight operations) per flying day (490 sorties/3,920 flight operations for the Proposed Action)

It is assumed that all sorties at Spokane IAP consist of one take-off and landing (two operations), one touch and gos (two operations), and two closed patterns (four operations)

Take off and landing includes Idle, Approach, Intermediate, and Military Time in Mode

Touch and Gos and Closed Patterns include Approach, Intermediate, and Military Time in Modes

Aircraft Emission Factors

Aircraft	Engine	Time in Mode (minutes)				Fuel Flow (lb/hr)			
KC-135R	F108-CF-100	Idle	App	Int	Mil	Idle	App	Int	Mil
Number of Engines:	4	47.70	5.20	1.60	0.70	1,136	2,547	5,650	6,458
NO _x Emission Factor (lb/1000 lb)									
		Idle	App	Int	Mil				
		3.94	6.96	13.53	15.28				
Emissions (lb/LTO)		14.23	6.15	8.15	4.60				
CO Emission Factor (lb/1000 lb)									
		Idle	App	Int	Mil				
		27.19	6.39	1.61	0.63				
Emissions (lb/LTO)		98.22	5.64	0.97	0.19				
VOC Emission Factor (lb/1000 lb)									
		Idle	App	Int	Mil				
		0.92	0.04	0.03	0.03				
Emissions (lb/LTO)		3.32	0.04	0.02	0.01				
PM _{10/2.5} Emission Factor (lb/1000 lb)									
		Idle	App	Int	Mil				
		9.08	1.55	0.65	1.59				
Emissions (lb/LTO)		32.80	1.37	0.39	0.48				
SO _x Emission Factor (lb/1000 lb)									
		Idle	App	Int	Mil				
		0.96	0.96	0.96	0.96				
Emissions (lb/LTO)		3.47	0.85	0.58	0.29				

Example: SO_x emission factor calculated based on the average sulfur content of JP-8 fuel, Table 3-6 USAF IERA 2002.
 $SO_x EF = 20 \times \text{wt \% sulfur} = 20 \times 0.048 \text{ wt \%} = 0.96 \text{ lb/1000 lb fuel}$
 $NO_x \text{ emissions for App} = (5.20 \text{ min}/(60 \text{ min/hr})) \times (2,547 \text{ lb/hr}) \times (6.96 \text{ lb/1000 lb}) \times (4 \text{ engines}) = 6.15 \text{ lbs/sortie}$

Notes: $EPC_{pol,mode} = (TIM/60) \times (FFR/1000) \times EF \times NE$
 $EPC_{pol,mode}$ = Emissions per cycle for a particular pollutant during a particular mode (lb/cycle)
TIM = Time in Mode (min/cycle)
60 = Factor for converting minutes to hours (min/hr)
FFR = Fuel Flow Rate per engine (lb/hr)
1000 = Factor for converting lb/hr to 1000 lb/hr
EF = Emission Factor (lb/1000 lb)
NE = Number of Engines on the aircraft
Emission factors for PM_{2.5} are conservatively assumed to be equivalent to PM₁₀.

Aircraft Emissions

Aircraft Emission Factors (Continued)

Total Emissions per Takeoff and Landings (lb)					
NO _x	CO	VOC	PM _{10/2.5}	SO _x	
33.14	105.03	3.39	35.04	5.18	

Total Emissions per Touch and Gos and Closed Patterns (lb)					
NO _x	CO	VOC	PM _{10/2.5}	SO _x	
18.90	6.80	0.06	2.24	1.72	

Example: NO_x emissions per LTO = Idle (14.23)+App (6.15)+Int (8.15)+Mil (4.60) = 33.14 lb

Notes: Total emissions per aircraft sortie for a particular pollutant are totaled by adding emissions from all operations and TIM cycles

Aircraft Emissions from Proposed Action at Grant County IAP and Spokane IAF

		Grant County IAP				
		Proposed Aircraft Emissions (tons per year)				
	Operations	NO _x	CO	VOC	PM _{10/2.5}	SO _x
Takeoff and Landing:	1,960	16.24	51.46	1.66	17.17	2.54
Touch and Gos	3,920	18.53	6.67	0.06	2.19	1.68
Closed Patterns	7,840	37.05	13.33	0.12	4.39	3.36
Total	13,720	71.82	71.46	1.84	23.75	7.58

		Spokane IAP				
		Proposed Aircraft Emissions (tons per year)				
	Operations	NO _x	CO	VOC	PM _{10/2.5}	SO _x
Takeoff and Landing:	980	8.12	25.73	0.83	8.59	1.27
Touch and Gos	980	4.63	1.67	0.02	0.55	0.42
Closed Patterns	1,960	9.26	3.33	0.03	1.10	0.84
Total	3,920	22.01	30.73	0.88	10.23	2.53

Example: Grant County IAP Takeoff and Landing NO_x emissions (tons per year) = (1,960 operations/2)*(33.14 lb/sortie)/(2,000 lb/ton) = 16.24 tons per year

Notes:

Estimates emissions from KC-135R aircraft exhaust.

Fuel flow and emissions data are from USAF IERA "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations", January 2002, Table 3-3 for Criteria Pollutant Emission Factors for Aircraft Engines.

Time in mode assumed based on default values presented in Table 3-7 of USAF IERA 2002 for the transport-turbine (KC-135) category

Criteria emission factors are per engine.

Aircraft Emissions

Eastern Washington- Northern Idaho Interstate Air Quality Control Region

			Point Source Emissions						Area Source Emissions (Non-Point and Mobile Sources)					
Row #	State	County	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOC	CO	NOx	PM ₁₀	PM _{2.5}	SO ₂	VOC
1	WA	Adams Co	0	0	0	0	0	0	23,848	4,204	13,475	2,140	286	2,543
2	WA	Asotin Co	0	0	0	0	0	0	6,140	566	1,339	302	44.6	1,265
3	ID	Benewah Co	0	0	0	0	0	0	8,609	981	5,177	917	91.2	2,354
4	WA	Columbia Co	0	0	0	0	0	0	11,208	547	4,540	1,007	62.7	2,285
5	WA	Garfield Co	0	0	0	0	0	0	3,613	484	3,373	535	57.6	471
6	WA	Grant Co	0	1	0	0	0	0	45,982	5,366	15,986	2,682	383	6,647
7	ID	Kootenai Co	338	314	41.7	32.3	2.64	251	32,324	5,952	23,930	3,842	460	10,542
8	ID	Latah Co	136	41.5	46.2	27.7	2.01	0	22,857	2,640	9,347	1,805	197	4,534
9	WA	Lincoln Co	0	0	0	0	0	0	16,435	3,135	15,021	2,231	245	1,674
10	ID	Nez Perce Co	3,691	1,672	331	209	52.7	373	24,504	3,128	6,000	1,407	268	4,453
11	ID	Shoshone Co	0	0	0	0	0	0	9,935	917	6,711	928	93.9	3,275
12	WA	Spokane Co	233	652	86.2	48.2	92.1	559	150,741	17,980	21,605	5,623	1,308	28,987
13	WA	Whitman Co	167	18.3	16	8.23	0.001	45.4	26,225	3,281	27,709	4,441	338	3,791
Grand Total			4,565	2,699	521	325	149	1,228	382,421	49,181	154,213	27,860	3,835	72,821

SOURCE:

<http://www.epa.gov/air/data/geosel.html>

USEPA - AirData NET Tier Report

*Net Air pollution sources (area and point) in tons per year (2002)

Site visited on 25 May 2009.

Eastern Washington- Northern Idaho Interstate Air Quality Control Region (40 CFR 81.100)

	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOC
Spokane	150,974	18,632	21,691	5,671	1,400	29,546
Grant	45,982	5,367	15,986	2,682	383	6,647
Total	386,986	51,880	154,734	28,185	3,984	74,049

AQCR Tier Report

APPENDIX D

CALCULATIONS TO SUPPORT THE NOISE EVALUATION

Appendix D

Calculations to Support the Noise Evaluation

Grant County IAP Analysis for Input into AEM 14 August 2009

Environmental Assessment Addressing the Repair of Runway 05/23 at Fairchild Air Force Base, Washington

Total 2008 Annual Operations from FAA:	70,515
FAA operations per day:	193.19
Additional C-17 daily operations from C-17 EA Proposed Action:	17.83
Total Grant County IAP Daily Baseline Operations:	211.02
LTOs per day (1 LTO = 2 operations):	105.51

Aircraft Type from C-17 EA	Daily Day Operations (0700-2200) from C-17 EA	Daily Night Operations (2200-0700) from C-17 EA	% of total day operations from C-17 EA	% of total night operations from C-17 EA	AEM Substitution	Substitution Source	# 2008 day ops	# 2008 night ops	# Day LTOs	# Night LTOs
<i>BASE Case</i>										
<i>Air Carrier</i>										
B-747	42.17	0	17.8%	0	747400	Most widely used B-747 variant	37.67	0	18.83	0
B-777	3.73	0	1.6%	0	777200	most widely used B-777 variant	3.33	0	1.67	0
B-767	3.73	0	1.6%	0	767300	most widely used B-767 variant	3.33	0	1.67	0
B-737	10.72	0	4.5%	0	737	--	9.58	0	4.79	0
DC-9	10.72	0	4.5%	0	DC910	--	9.58	0	4.79	0
<i>Air Taxi</i>										
C-208	14.79	0	6.3%	0	GASEPF	Sub for CNA208 (C-208) per AEM	13.21	0	6.61	0
<i>General Aviation</i>										
C-172	43.59	0	18.5%	0	CNA172	--	38.94	0	19.47	0
C-210	10.9	0	4.6%	0	CNA206	Sub for CNA210 (C-210) per AEM	9.74	0	4.87	0
<i>Military</i>										
C-17*	64.067	21.433	27.1%	9.1%	DC870	Sub for C-17 per AEM	57.23	19.14425324	28.61	9.57
P-3^	10.4	0	4.4%	0	L118	P-3 was developed from the L-118	9.29	0	4.64	0
TOTAL	236.25		100.0%				211.02		105.51	

* The C-17 values include the Baseline C-17 Annual Operations from Table 2.2-1, and the proposed operations from Table 2.2-4 of the C-17 EA, as the FONSI was signed therefore it is assumed that the proposed flights are being conducted.

^ The C-17 EA included 2.60 daily operations for the EA-68 aircraft. A suitable AEM substitution for the EA-68 could not be found, so those operations were added to the P-3 aircraft.

C-17 EA reference:

Scott Air Force Base (AFB). 2008. Environmental Assessment Interim Western United States C-17 Landing Zone. Tables 2.2-1 and 2.4-1. May 2008.

Spokane IAP Analysis for Input into AEM 14 August 2009

Environmental Assessment Addressing the Repair of Runway 05/23 at Fairchild Air Force Base, Washington

Total 2008 Annual Operations from FAA: 94,694
 Operations per day: 259.44
 LTOs per day (1 LTO = 2 operations): 129.72

Aircraft Group	% Daily Operations by aircraft group per AirNav	General Aircraft Type Assumed	AEM Substitution	Sub Source	# 2008 day ops*	# 2008 night ops*	# Day LTOs	# Night LTOs
<i>BASE Case</i>								
Commercial	46%	B-747	747400	Most widely used B-747 variant	112.18	7.16	56.09	3.58
Air Taxi	20%	A-320	A320232	Most recent A-320 variant (1993)	48.77	3.11	24.39	1.56
Transient General Aviation	17%	C-210	CNA206	Sub for CNA210 (C-210) per AEM	41.46	2.65	20.73	1.32
Local General Aviation	15%	C-172	CNA172	--	36.58	2.33	18.29	1.17
Military	2%	C-17	DC870	Sub for C-17 per AEM	4.88	0.31	2.44	0.16
TOTAL	100%				259.44		129.72	

* Per AirNav, Spokane IAP is operational from 0600-2200 (16 hours a day). Since 1 of those 16 hours is at night [2200 to 0700], it was assumed that 6 percent [1/16] of the flight operations are conducted at night.

AirNav Reference:

AirNav. 2009. "KGEK Spokane International Airport, Spokane, Washington, USA." FAA information effective 02 July 2009. Available online: <<http://www.airnav.com/airport/KGEG>>. Accessed 14 August 2009.

ALTERNATIVE Case (includes all baseline LTOs shown above, plus below)

Airport	Aircraft Type	# 2008 day ops	# 2008 night ops	# Day LTOs	# Night LTOs
Grant County IAP	KC135R	54	2	27	1
Spokane IAP	KC135R	14	2	7	1

Source for day and night operations:

O'Connell, James. 2009. Email correspondence between Lt. Col James O'Connell (Deputy Commander, 92nd Operations Group, Fairchild AFB) and Mr. Sean McCain (Project Manager, HDR|e²M) regarding noise scenarios related to temporary relocation of KC-135Rs to Grant County IAP and Spokane IAP. 18 August 2009.

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	Grant County IAP
--------------------	------------------

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65	3.1	3.7	16.8%

Aircraft Type	BASE Case		ALTERNATIVE Case	
	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D				
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QE				
737	4.84		4.84	
737300				
7373B2				
737400				
737500				
737700				
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

Aircraft Type	BASE Case		ALTERNATIVE Case	
	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400	19.04		19.04	
747SP				
757300				
757PW				
757RR				
767300	1.68		1.68	
767400				
767CF6				
767JT9				
777200	1.68		1.68	
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P				
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172	19.68		19.68	
CNA206	4.92		4.92	
CNA20T				
CNA441				
CNA500				
CNA55B				
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				

Aircraft Type	BASE Case		ALTERNATIVE Case	
	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC850				
DC860				
DC870	28.93	9.68	28.93	9.68
DC8QN				
DC910	4.84		4.84	
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6				
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF	6.68		6.68	
GASEPV				
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R			27.00	1.00
L1011				
L10115				
L188	4.64		4.64	
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				

Aircraft Type	BASE Case		ALTERNATIVE Case	
	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD82				
MD83				
MD9025				
MD9028				
MU3001				
PA28				
PA30				
PA31				
SABR80				
SD330				
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	Spokane IAP
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DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65	2.9	3.2	8.9%

Aircraft Type	BASE Case		ALTERNATIVE Case	
	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D				
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

Aircraft Type	BASE Case		ALTERNATIVE Case	
	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400	56.09	3.58	56.09	3.58
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232	24.39	1.56	24.39	1.56
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P				
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172	18.29	1.17	18.29	1.17
CNA206	20.73	1.32	20.73	1.32
CNA20T				
CNA441				
CNA500				
CNA55B				
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				

Aircraft Type	BASE Case		ALTERNATIVE Case	
	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC850				
DC860				
DC870	2.44	0.16	2.44	0.16
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6				
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF				
GASEPV				
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R			7.00	1.00
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				

Aircraft Type	BASE Case		ALTERNATIVE Case	
	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD82				
MD83				
MD9025				
MD9028				
MU3001				
PA28				
PA30				
PA31				
SABR80				
SD330				
SF340				